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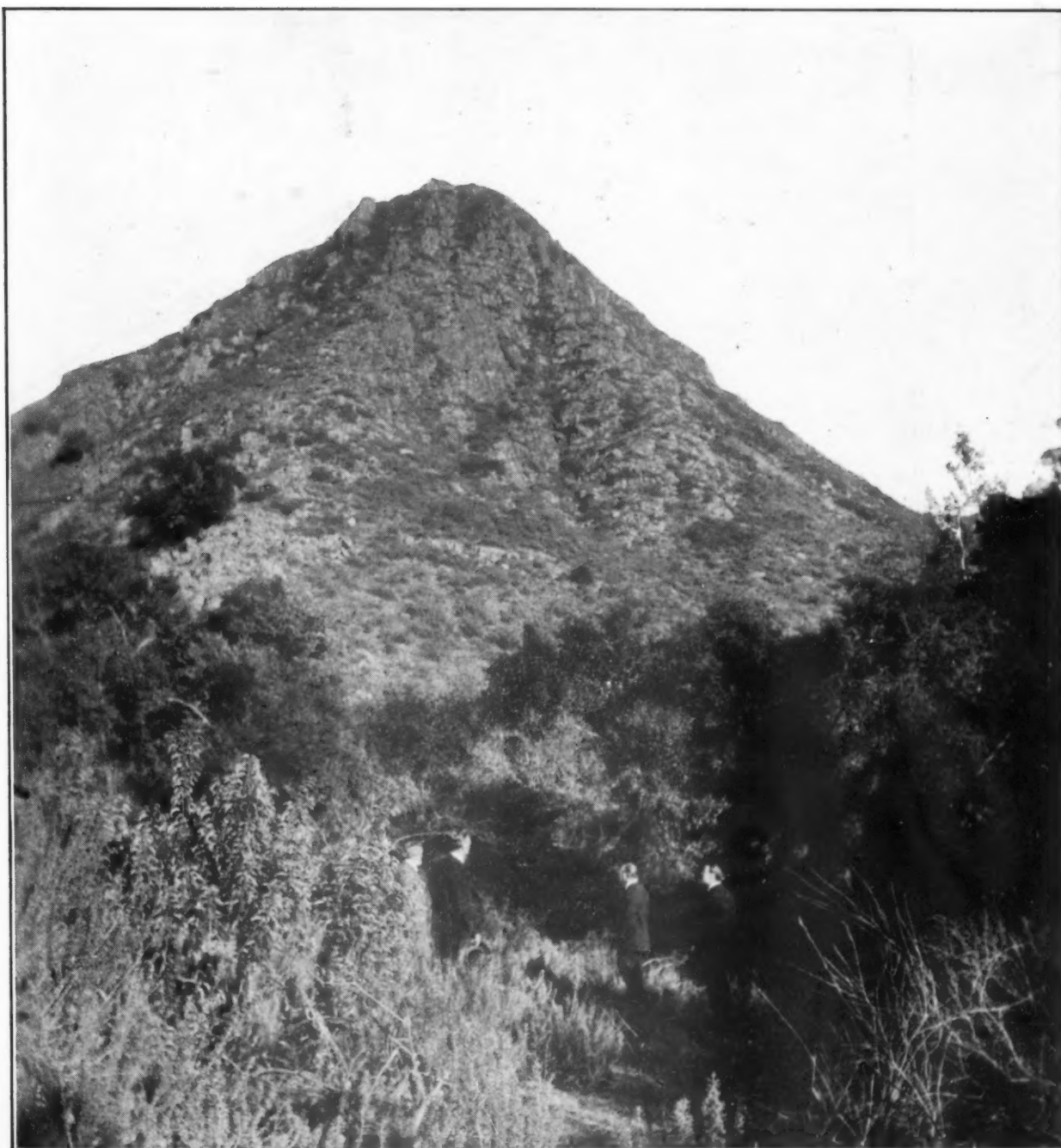
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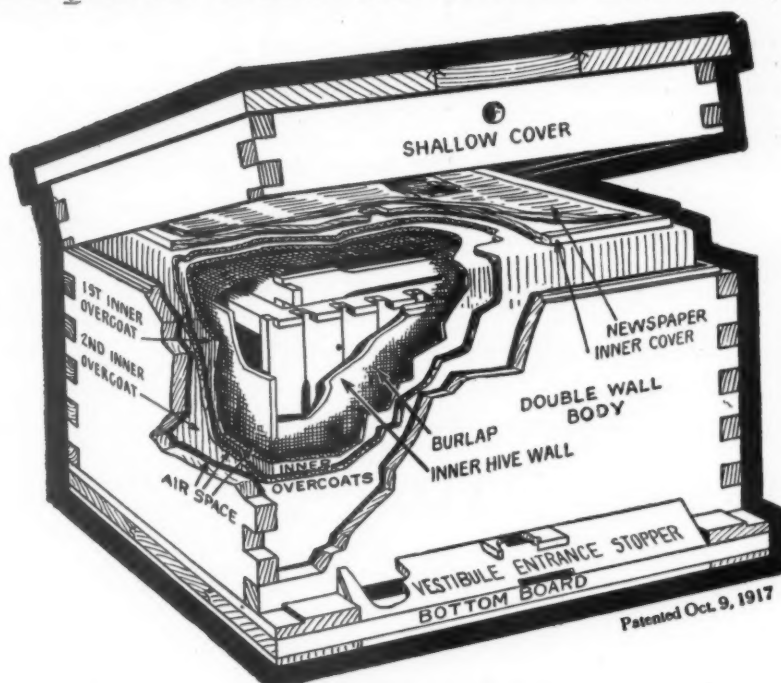
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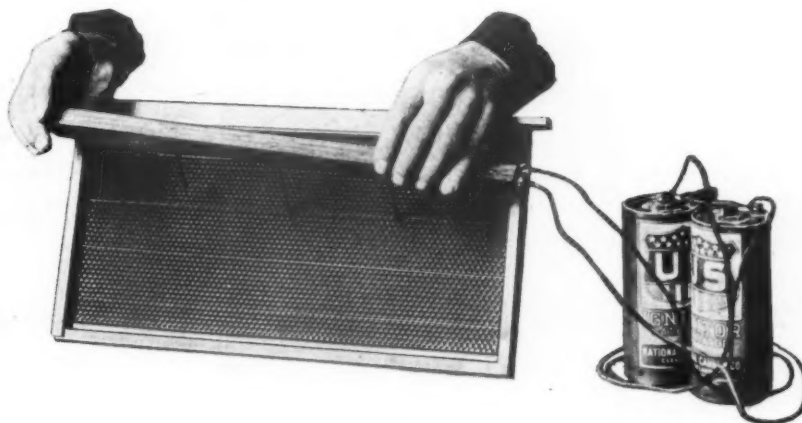
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VOL. LIX—NO. 4

HAMILTON, ILL., APRIL, 1919

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THE BEE-FLOWERS OF NORTH AMERICA

BY JOHN H. LOVELL

Note. There are thousands of bee-flowers which are not honey-plants, and many honey-plants are not bee-flowers, although the bees get honey from them. This article endeavors to make clear the importance of bees to flowers. Bee-flowers are flowers which are adapted to bees rather than to other insects. When the author says that the blackberry is not a bee-flower, he means that this plant is not dependent upon bees, so long as other insects are abundant.—Ed.

IN the diverse, yet inseparably united relations of nature, bees play three very important roles, as honey-makers, flower-makers and fruit makers. As makers of honey the habits and industry of the honey-bee have excited wonder and admiration for many years, but it is only recently that their services in the production of fruit have been appreciated. Modern fruit culture is dependent on bees. Many cultivated fruits are self-sterile, and all appear to yield better when cross-pollinated. Every fruit plantation should have its apiary. The service rendered by bees (both social and solitary) to this country annually in the pollination of fruits and vegetables, buckwheat, fodder plants and many flowers certainly exceeds in value \$100,000,000, in its widest sense, indeed, it is beyond price.

There is not a person living who comprehends what our flora would be like, if there had been no bees. They have been the unconscious builders of thousands of bright-colored, attractive blossoms. Alone among insects they feed their brood on pollen, and to store in their cells a sufficient quantity of it requires countless visits to the bloom of plants throughout the entire season. It was a momentous epoch in the world's history when the ancestors of the bees became flower visitors. These primitive insects were wasp-like in appearance, with smooth bodies and



Fig. 1.—Gladiolus. A bumblebee flower

short tongues. They tunneled in the ground, as is still the habit of most solitary bees; and, when they began to provision their nests with balls of pollen instead of dead insects, the foundation was laid for the prosperity of the future race of bees, and indirectly for a powerful influence on mankind.

While bees have been a more important factor in the development of the majority of conspicuous flowers in our flora than any other group of insects, the effect of their visits is most evident in bee-flowers. A bee-flower has the nectar concealed and is, or was, chiefly pollinated by bees, as white and red clover, the mountain laurel and the larkspur.

Many of them are valuable honey-plants; and, in showing us the ways in which bees have modified flowers in the past, they should teach us some useful lessons in regard to the possibilities of the future.

A list of North American bee-flowers shows that they are very widely and unevenly distributed in the different plant families. A great family, as the pea, mint, or figwort family, may consist almost entirely of bee-flowers, while there may be none, or only a few, in other large families. There are no flowers adapted to bees in the pink, mustard or carrot families, and they are likewise absent from that immense group, the Compositæ, which contains the asters, goldenrods and thistles. The inflorescence of this family represents Nature's greatest triumph in flower building, and is well worthy of the careful consideration of both beekeeper and botanist. No other family contains so many honey-plants. The individual flower is of little significance, and conspicuousness is gained by massing many of them in a head, an arrangement which permits insects to visit them very rapidly. Intercrossing, economy of time and material, a large number of seeds and their wide distribution have all been perfectly attained. In this the most successful of plant families there is a large and varied company of visitors to the flowers and little modification of the corolla, just the opposite of conditions in the orchis family, to which we shall refer a little later.

In order to obtain a clear understanding of bee-flowers it is necessary to consider more in detail a few of the common species. Let us begin with the lily family, which contains so many familiar field and garden flowers, among which are the bee-flowers, Solomon's seal, the twisted stalk, grape hyacinth, lily-of-the-valley, asparagus and squills. The green tubular flowers of Solomon's seal are pendulous and adapted to bumblebees. The deep blue flowers of the grape hyacinth (*Muscari*) are urn-shaped, hang downward, and bees gather the nectar from the oblong clusters, which resemble bunches

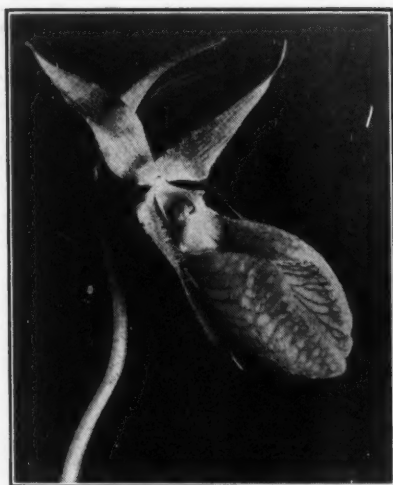


Fig. 2.—Lady's slipper. A small bee-flower

of small grapes. Bees visit the little bells of the lily-of-the-valley for pollen only. Asparagus is a good honey-plant and the inverted green flowers yield nectar freely; it is extensively cultivated in America and grows wild so abundantly on the Russian steppes that the cattle feed upon it like grass. The lilies are chiefly pollinated by butterflies. In the lily family the bee-flowers differ from the other forms chiefly in their pendulous position and longer and partly closed corolla.

But in the orchis family we meet with a number of bumblebee flowers, as the snowy orchis *Pogonia* and *Arethusa*, which are brilliantly colored and very irregular in form. This is a family of marvels, with an endless variety of bizarre forms, in some instances mimicking bees, flies and birds; one species (*Catasetum*), produces three flowers so unlike that when they were first brought to Europe they were described as belonging to three different genera. Imagine, then, the consternation of the botanical species-maker when Sir Ralph Schomburgk declared that he had seen all three flowers growing on one plant. A typical orchis flower consists of 15 organs, but usually they are so modified and united that only 7 or 8 can be discovered. Unlike the Compositae, the individual flower is very highly specialized, the nectar is deeply concealed (an orchid from Madagascar has a nectary ten inches long), and visitors are few both in kind and number. Many of the flowers fail to set seed, sometimes not one in a thousand, and much of the seed proves sterile. The species are rare and do not succeed well in competition with hardy plants. The orchis family is far less successful than the Compositae, and we are forced to conclude that elaborate modification and adaptation to a few insects is apt to prove a disadvantage. Of the 5,000 species none of them are good honey-plants, and only one, the vanilla bean, is of economic importance.

The lady's slipper (*Cypripedium acaule*) is a ground-bee or Andrenid flower. Small bees of the genus *Andrena* enter the slipper between the

two front elastic folds, which immediately close again after it. The trapped bees make their escape through one of the two small holes at the base of the flower, coming first in contact with the stigma and then rubbing from the anther pollen which is carried to the next flower visited. (Fig. 2.)

In the American Bee Journal for August, 1917, brief descriptions were given of the columbine, monkshood and bee-larkspur, bumblebee-flowers frequently cultivated in gardens. Other peculiar shaped bee-flowers are the Dutchman's breeches (*Dicentra*), bleeding heart, climbing fumitory, the pale *Corydalis*, the jewelweed, and the blue violet. The object of these odd forms, so far as they are not an incidental result, is to compel the bee to pursue a fixed path to the nectar, so that pollination may be effected with greater certainty, e. g., in the



Fig. 3.—Wild bean. A bee-flower growing in damp thickets

violet the bee is compelled to come in contact first with the stigma and then with the pollen, since it must run its tongue through the cone of anthers in the center of the flower in order to obtain the nectar. Many bee-flowers are so dependent on the visits of the bees that in their absence they fail to produce seed, as red and white clover, *Salvia* and larkspur.

A very remarkable bee-flower from Europe, the seed of which may be obtained from any florist, is the fennel-flower, or ragged lady, or, as it is sometimes called from its finely dissected foliage, love-in-the-mist (*Nigella damascena*). The eight petals are transformed into nectaries, and in each one there is a little bowl or cavity covered with an elastic lid. Bees are the only insects clever enough to lift this lid and suck the nectar, and when they go away it again falls into place. Clearly in the absence of bees this flower would never have been evolved, and clearly, too, bees are the most skillful of all flower-visitors.

Bee-flowers are almost entirely absent from the rose family, but

there is one that well deserves our gratitude—the raspberry. The blackberries, the plums, the cherries, the thornbushes, are not bee-flowers, but the raspberry is a true bee-flower, although it is also visited by other insects. The flowers are inverted, and the petals stand erect, crowding the stamens against the cone of pistils in the center; the nectar is secreted by a ring between them. Bees can cling to the under side of the flower and reach the partially concealed nectar better than other insects. Perhaps the reason the blackberry yields much less nectar than the raspberry is because it is not a bee-flower.

The various steps by which a tubular bee-flower may be evolved are well illustrated by the currants and gooseberries, shrubs familiar to every farmer. The petals are small and scale-like, and it is the sepals which are chiefly employed in shutting out other insects. The common red currant has greenish nearly flat flowers, the broad sepals open widely and the nectar can be readily gathered by many insects. But in the European gooseberry (*Ribes Grossularia*) the blossoms are little hanging bells with the entrance narrowed and partly closed by a fringe of hairs. Flies cannot obtain much of the nectar. The black currant (*R. nigrum*) has still deeper bells. Honeybees not only gather nectar from the flowers, but also in their haste open the buds. Slightly different stages are shown by many other species; but in the golden currant (*R. aurcum*) the calyx is cylindrical, nearly half an inch long and the only visitors are bees. The bright golden flowers change with age to a deep red, a color change which easily distinguishes the older flowers which have been pollinated and have ceased to secrete nectar. Nature often speaks in enigmas, but at times she is a very patient teacher, revealing her methods step by step, if we will only take the trouble to observe them. But mankind is too often typified by the man

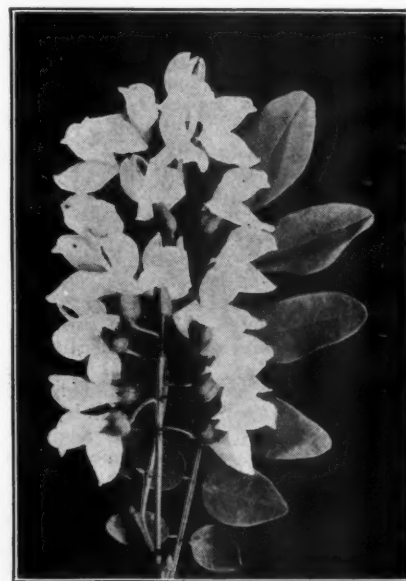


Fig. 4.—Black locust. A bee-flower

in the house of the Interpreter, who, with eyes cast down, raked to himself sticks and straws, and would not look up and behold the one who offered him a celestial crown.

The pea family, or Papilionaceae (Gray makes this family a sub-family of the pulse family or Leguminosae), consists almost wholly of bee-flowers, of which there are some 5,000. Among them are many excellent honey-plants, as the clovers, alfalfas, sweet clovers, vetches, false indigo, sainfoin and locust. The butterfly-shaped form is well shown by the sweet peas, with its broad, showy standard, wing petals and keel enclosing the stamens and pistil. Both the individual flowers and the flower-clusters are highly attractive and conspicuous; the clovers and vetches brighten large areas with their bloom, and in Texas the blue lupine carpets the ground for miles with its blue blossoms. Of the 197 species in the northern states, 39 are white, 33 yellow, 13 red, 88 blue-purple, and 24 blue. The predominance of blue and blue-purple flowers is noteworthy. When more than two species occur in a genus it is seldom monochromatic, it usually contains flowers of more than one color; of the clovers, 4 are white, 3 yellow, 4 red and 3 red-purple; of the tick-trefoils, 2 are white, 1 red and 19 blue-purple. The flower fidelity of a bee is greatly helped by these differences in color. (Fig. 3.)

This great family of bee-flowers is in so many ways unique among plant families that we are reluctant to leave it. Why, when bee-flowers are wholly absent or few in number in so many families, does there occur this vast assemblage of them in a natural group? This is not a matter of chance. The teleologist of a century ago would have told us that they were made so, and thus have dodged the question and closed the door of investigation. Today we seek for actual causes. The abundance of these plants is partly due to their great vegetative vigor, which is partially explained by their strong root system and to the presence of nitro-

gen-fixing bacteria on the roots. Another cause is the great vitality of the seeds which are longer lived than those of any other plant family; certain legume seeds retain their viability after 150 to 250 years. Everyone knows that beans will germinate after years in storage. Fig. 4.

The flowers of this family at some time in the remote past were regular in form, as they still are at times in the common laburnum; but the butterfly-shaped corolla was very early developed and was handed down to the various genera as they successively appeared. Many species are very efficiently pollinated by bees; but others are not, and many flowers show slight imperfections, as though Nature, like Jove, had nodded at times in the never-ending work of creation. The normal flowers of the wild peanut are generally barren, lucerne secretes nectar longer than is needful, bees puncture some species and rob others through crevices,

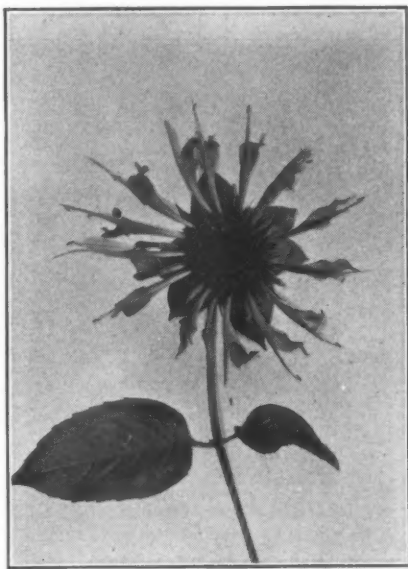


Fig. 6—Bee-balm. A bee-flower of the mint family

while the garden pea is wholly self-fertilized. I know of but one bee in the northern states able to depress the keel of the sweet pea, and that is the large leaf-cutting bee (*Megachile latimanus*). There can be no doubt that many of the species would be better off if they received, like the Compositae, a greater variety of visitors.

In the heath and blueberry families there is another great group of bee-flowers; but unlike the members of the pea family they are all shrubs or small trees. (Fig. 10.) The *Rhododendrons* and *Azaleas* are handsome bumblebee flowers, but the rotate blossoms of the mountain laurel invite bees of all kinds. Other familiar genera are the checkerberry, fetterbush, *Andromeda*, trailing arbutus, sourwood, leather-leaf, bearberry, and heather, several of which are indispensable to bee culture. The flowers are small, white or pink, urn-shaped, often pendulous, and the pollen is sprinkled over the bees from pores in the ends of the anthers.



Fig. 7.—Skullcap. A two-lipped bee-flower of the mint family. The long corolla tube points to bumblebees as the most important pollinators

Sour-wood, in the Appalachian region, is one of three leading honey-plants.

The heathers or heaths are not indigenous to America, although three species occur locally in eastern New England; but in northern and western Europe heather or ling (*Calluna vulgaris*) covers vast areas of waste or sterile lands called moors. When it grows a yard tall, the fine evergreen leaves, the purple stems, and profusion of pink flowers present an expanse of color long to be remembered. Its uses among the peasants are numberless, being employed for brooms, brushes, baskets, fuel, brewing, roofing, beds, dyeing and fodder. Another beautiful heath, the purple heath (*Erica cinerea*) is also common on the lower moors of Great Britain. Both secrete nectar plentifully and furnish a generous surplus of amber-colored honey, with an aromatic flavor, but so viscous that it is difficult to extract. In southwestern Africa the heaths reach their maximum and the 500 species are a prominent element in the vegetation of that region, reaching the height of 12 feet and being covered with white or pink blossoms for a large part of the year.

Blue bumblebee flowers among the gentians delight the traveler in the Alps with their vivid masses of blue coloring, and the blue bellflowers are also partly bumblebee flowers. (Fig. 5). Another blue bee-flower is borage, which has become so common wild in Australia that it is listed as



Fig. 5.—Fringed Gentian. A bumblebee flower

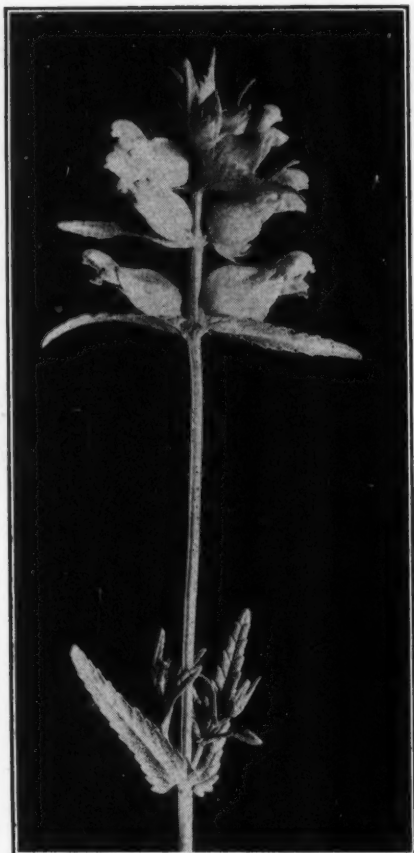


Fig. 8.—Yellow rattle. A bee-flower of the figwort family

a honey-plant. The flowers of the borage family are often at first red and later change to blue, and several species are filled with coloring material. In the sheep pastures of New Mexico there grows blood purslane (*Plagiobothrys arizonicus*); "when the sheep find a patch of it, it colors their heads red clear to the ears."

In the mint family (*Labiatae*) and figwort family (*Scrophulariaceae*) there are many bee-flowers, which stand nearly horizontal and are mostly 2-lipped. According to the way the lips have developed the larger flowers exhibit strange fantastic forms, which mimic the heads of reptiles, animals, or inanimate objects; such are the turtlehead, snapdragon, monkey-flower, toadflax, foxglove; skullcap, shoe-flower, painted cup and dragon-head. The species in both families number nearly 5,000, and are chiefly herbaceous. Among the more important honey-plants in the mint family are the sages, catnip, hoarhound, pennyroyal and motherwort; but in the figwort family honey-plants are rare, perhaps the best known being the figwort. Neither family promises to be of much benefit to the beekeeper, except locally. (Figs. 6, 7 and 8.)

Regular flowers, it will be noticed, stand vertical, that is, they either face the sky or the earth; while irregular flowers always stand more or less horizontal. In the dense flower-cluster of the horse-chestnut the lateral flowers are irregular, and the single terminal flower is perfectly

regular. A vertical flower is approached by insects from all sides with equal ease, and the forces which might tend to change its form are in equilibrium, or counterbalance each other, as in the buttercup and strawberry; but when a flower stands horizontal, like the snapdragon or sage, bees nearly always alight on the lower side of the corolla. The lower petals become transformed into a lip, which serves as a landing stage; and the upper petals are modified into a helmet to protect the anthers from rain. A bilabiate flower, is, after all, not such a great marvel. (Fig. 9.)

So long as a flower is flat like a plate, it attracts a varied company of insects; but as soon as it becomes bilateral many insects either cannot find the nectar or are unable to reach it, with the inevitable result that the visitors are restricted chiefly to bees. None but bees can learn from observation to find the nectar of fennel-flower. No bees but bumblebees have tongues long enough to reach the nectar of the bee larkspur, and none



Fig. 9.—Two varieties of the monkey flower. A bumblebee flower. Note the horizontal position of blossoms.

but bumblebees are strong enough to push their way into flowers like snapdragon.

The bee-flowers of Europe are essentially the same as those of North America and belong to the same genera and families, but the species are often different. In the German and Swiss flora there are 482 bee-flowers, of which 152 are white and yellow, and 330 red, violet and blue. Honeybees and bumblebees have been observed to make 20 per cent more visits to the red and blue flowers than to the white and yellow. East of the Rocky Mountains and north of Tennessee there are 366 red and red-purple flowers, and 519 blue and blue-purple flowers; and a large per cent of them are bee-flowers. Why are so many bee-flowers red and blue, especially blue? There is no reason to suppose that blue coloration gives bees an aesthetic pleasure, but on the other hand I have

shown experimentally that they can readily distinguish blue from other hues. So keen an observer as the honeybee might easily learn to associate blue with flowers likely to supply it with nectar. In primitive genera in which the corolla has been little modified blue is almost entirely absent, as in the yellow buttercups, fivefingers and St. John's-worts; and in the white water-plains and saxifrages, and the yellow and white mustards. While there are exceptions, it is certain that blue coloration is correlated in some way with the high specialization of the corolla. Whatever the origin of floral colors, there is no doubt but what they are an advantage, and that in the absence of insects, especially bees, they would never have been evolved.

Bees have been the most important agents in the development not only of bee-flowers, but of most conspicuous blossoms. We cannot imagine what the world would have been without them, or estimate the enjoyment that would have been lost, or the power for good that would have been forever missing; but we know that humanity would have been less perfect than it is today. They have been the humble, unconscious instruments in producing results that enter into the very foundations of modern civilization.

Intensive Beekeeping

By F. W. Sladen, Apiarist, Dominion Experimental Farms.

IN a locality where colonies are ready to swarm a month before the principal honey-flow begins, an increased number of bees can be raised for honey production by wintering two queens in the hive.

This conclusion has resulted from investigations the writer has been making into conditions at Ottawa,



Fig. 10.—Black huckleberry. A bee-flower with bell-shaped corolla

Canada, where a honey-flow from dandelion causes swarming at the end of May in colonies that have wintered well, and the honey-flow from clover does not begin until the end of June. It is simply the guiding principle of spring management, the raising of a maximum number of bees in time for the principal honey-flow, pressed, under specially favorable conditions, to a stage beyond what is possible by following the accepted rules of management.

With only one queen in the hive, should early swarming take place, there is the serious interruption in breeding caused by the swarming and the time taken for the old queen to get into full laying again and the young queen to get mated and attain full laying. Should swarming be prevented, the queen soon reaches the limit of fecundity, and before long the number of bees produced daily ceases to increase.

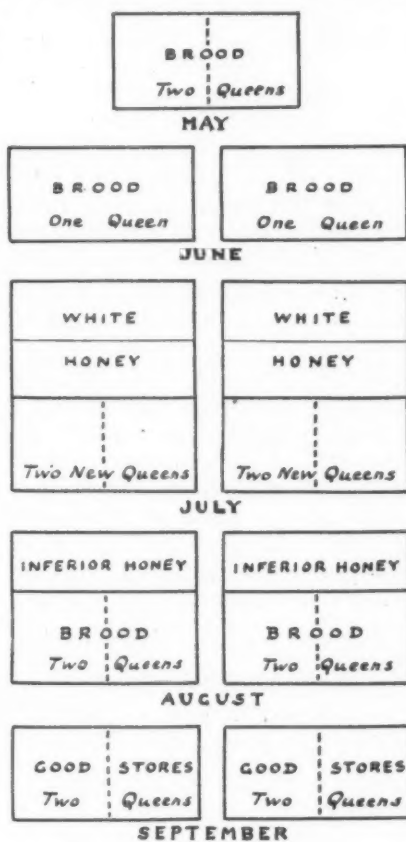
On the other hand, with two queens in the hive, separated by a double wire cloth division, if one of these with her bees is removed to an adjacent empty hive a few days before the swarming season begins, there will be a steadily accelerating production of young bees, provided it is not checked by a honey dearth, a condition that can be remedied by slow feeding.

From a hive of bees containing two queens wintered at Ottawa in 1917-18, that covered $5\frac{1}{2}$ combs on April 25, 480 pounds of honey were produced, while an average of only 223 pounds each was produced in two colonies of equal strength then, that contained only one queen. However, as only one and two colonies were compared, and as one-half of the bees that produced the large return were fed during a part of the honey dearth in June, and the other half consisted of hybrids, these figures cannot be regarded as conclusive. Yet there is every indication that the gain will be great. A satisfactory feature of wintering two queens in a hive and putting one of them with half the bees into another hive during the dandelion flow, is that some of the chief troubles of spring management are thus avoided. Early swarming is prevented, and the inferior dandelion honey is turned into bees.

These considerations have formed the starting point of a system which was evolved and tested last summer, for getting the two queens established in the hive and also for the prevention of swarming without much labor, which is one of the great problems in northern apiaries. This system, which consists essentially in removing the old queen from the brood-chamber during the early part of the main honey-flow, while two others are raised and mated there, the wire-cloth screen being again inserted and a special portico placed in front of the hive to prevent the young queens from meeting or entering one another's sides after the mating flights, has brought other advantages in its train: the annual requeening, the raising of a greater number of young bees in August for wintering than in a col-

ony having only one queen; and last but not least, the removal from the brood-chamber by the bees, to make room for this brood, of a great deal of honey, more or less unwholesome for wintering, so that its place can be filled with a wholesome mixture of sugar syrup and clover honey fed to the bees as soon as breeding has ceased. A colony wintered well on this mixture in 1917-18. In the writer's opinion, unwholesome stores is one of the greatest and most difficult-to-remedy causes of winter loss in many parts of Canada.

This system is so different from the ordinary methods of beekeeping that it cannot be recommended, unless after extensive trial it proves successful. All that can be said at



Sladen's experimental plan with two queens in one hive

present is that, after a small and necessarily somewhat imperfect trial, it has proved to be workable and looks promising.

During the clover honey-flow in 1918, thirteen colonies had their queens removed from the brood-chamber and eight days later all queen-cells were cut out except two, one on each side of the double wire-cloth division then inserted, or two special cells were substituted. In six of these colonies fertile queens and worker brood were found on both sides of the division in early August and in six more on one side only. No swarming took place, although nearly all the other colonies in the apiary repeatedly built cells in preparation for swarming.

It was decided that a good way to make good the failures, was to intro-

duce with her brood in early August, when the white honey was removed and the super for dark honey was placed on the hive, a selected old queen, which, after her removal from the brood-chamber at the commencement of the honey-flow, had been caged for eight days in the super, and had then been placed in a weak nucleus specially made for her, with one of the combs containing a little brood and a few bees from her colony.

Heretofore the only successful method of swarm prevention at Ottawa has been the finding and cutting out of all queen-cells, entailing the lifting off and on of supers, frequently heavy with honey, every week, sometimes oftener, during the nine weeks the swarming season lasts, which is a great labor. If the above method of preventing swarming, which requires only two or three easy manipulations, proves to be a success on a large scale, as it has already done on a small one, its adoption will be justified, even though, under some conditions, it may inhibit slightly the production of honey, because it leaves the beekeeper free to manage a much larger number of colonies, and it forms a part of a system, several features of which are calculated to considerably increase honey production.

The system constitutes a good control measure for European foulbrood, and the annual requeening will eliminate losses from old and worn-out queens that figure high in many apiaries.

Details of the experiments with this system were given in the "Canadian Horticulturist and Beekeeper" for October, 1918. Ottawa, Ont.

Honey From Tobacco

Located as we are, in the heart of the Florida shaded tobacco section, we have had some little experience with tobacco as a honey plant. Twice in five years we have had a flow from that source. First in 1915 and another, and heavier, the past season. Growers usually cut tobacco stalks immediately after harvesting the crop, and for that reason we have had only the two flows, and are unable to say how long or heavy they would be if stalks were left standing. Harvesting tobacco is usually over by the middle of July, and because of the scarcity of labor the past season stalks were left standing for a week or ten days longer than usual, and during this time we got a surplus.

The honey is of heavy body, in fact very heavy and dark, almost like "Blackstrap" molasses. It has never granulated with us, though it might in a cooler climate.

I cannot describe the flavor, but you tupelo and clover producers need not be alarmed. We do not claim it to be better—nor do we expect to take your "fancy trade" with it. A mixture of "Star Navy" and "Brown's Mule" chewing tobacco will give you some idea of the flavor.

J. T. DE LACY, Havana, Fla.

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THE STAFF

C. P. DADANT Editor
FRANK C. PELLETT Associate Editor
C. C. MILLER Questions Department
MAURICE G. DADANT Business Manager

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THE EDITOR'S VIEWPOINT

Cost of Honey From Package Bees

The Iowa College of Agriculture is conducting some interesting experiments in apiculture, under Prof. Wallace Parks. The past season careful weights were made to ascertain the cost of wintering over colonies and the surplus secured was compared to that secured from package bees from the South. One, two and three-pound packages were used in the experiment. The costs of honey secured are interesting and while a single season does not give any very satisfactory data it is clear that unless better results can be shown in favor of the packages, that it will not pay to destroy our bees in the fall of the year and depend upon replacing them from the south the following spring. Under this experiment the costs per pound of honey stored was as follows:

1-pound package	\$.28
2-pound package13—
3-pound package13—
Wintered colonies08

The difference in cost between the two and three-pound package is so slight as to be surprising, and this in the face of a poor season. It would be expected that the difference would favor the larger package, especially in a poor year. We understand that the experiment will be continued, and results will be watched with interest. The one-pound package is too small for immediate results, and little more than the establishment of a colony can be expected from a single pound of bees, unless it be an exceptional season.

Honey Plants

We are publishing in this issue some interesting letters concerning

the climbing milkweed or shoestring vine. This plant is of limited distribution and is not generally known, yet it is a very important honey plant in the region where it grows. W. L. Wiley, of Brunswick, Mo., writes that it furnished most of the surplus in that locality last year and that strong colonies stored 100 pounds or more from this source.

There are dozens of good plants which are not widely distributed and consequently little known. We will be very glad if our readers will co-operate with us in making a survey of the honey plants of the entire country. Whenever the bees are found to be working freely on a plant which is not generally discussed, we will appreciate samples of the plant, together with the blossoms and full notes concerning the amount and kind of honey secured, time of blooming and any other interesting information. We have been at work for the past three years on a volume of the honey plants and such information will be of great help to us. It is only through the co-operation of the beekeepers of the whole country that we can hope to make the volume complete enough to be of real value. Much has been written about alfalfa, sweet clover, basswood, the sages and a few others of great importance, but we are anxious to get information on the plants which are important in a few localities and which are seldom heard of elsewhere.

In our last issue, and again in this, are several letters about the corn plant which serve to throw some light on the question as to whether bees get honey from corn. Although our success depends upon the honey-plants of our immediate locality, less is known about the problems of nec-

tar secretion than any other phase of beekeeping. We feel that matter of this kind should be of much interest and value to our readers.

Shallow Brood-frames

In the discussion of the proper size for brood-chambers that will accommodate the most prolific queens, the matter of shallow stories is drawing the attention of a large number of critics. One man writes that the locating of the brood-nest in one, two or more separate bodies, has no influence whatever upon the amount of brood that the queen will produce. I am quite willing to agree that there is a possible difference in the experience of different apiarists on this subject, as mentioned on page 50 of the February number. But that the separation of the brood-chamber into two or more stories should make no difference whatever in the laying of the queen, is an untenable proposition.

Those of the readers who have the revised edition of "The Hive and Honeybee" are requested to turn to page 143, Fig. 59. Those who have only one of the original Langstroth editions are requested to look up Plate 1, Figs. 1 and 2, where the same cuts are found. They will there see that Mr. Langstroth at one time used frames with a perpendicular bar or partition in the middle. This bar had a groove in it which was intended for a "winter passage." As we tried nearly every invention Mr. Langstroth ever described, we also tried these perpendicular divisions and found that the queens would often breed on one side of them only.

The senior Dadant, who estimated the value of pieces of worker-comb very highly, was in the habit, before the invention of comb-foundation made broken worker-comb less valuable, of making horizontal partitions in brood-frames, in order to more readily fasten in pieces of worker-comb as small as 5 inches square. Often the queens would lay on the upper or lower side of such partitions to the exclusion of the other side. We also used divisible frames for making nuclei in queen-breeding. The same trouble exhibited itself. Anyone who cares to do so may try such experiments. Not in every case, but in many cases, perhaps one-fourth of the time, the queens would find such divisions an obstacle sufficient to cause them to turn away, for the time being, though they usually came back to them afterwards.

What, then, must it be when they have, not only a bar, but two bars and a beespace to pass over before changing from one story to another? It is true that they finally do it. But how much time is lost in hesitating and hunting can hardly be guessed.

There is a great deal of method in the queen's laying. To convince ourselves of this, it is only necessary to look at combs of brood. The older brood is usually in the center, the younger brood around the edges. The queen evidently goes around a circle and thus loses but little time looking for cells that are empty and ready. Otherwise how could she lay from 3,000 to 4,000 eggs in 24 hours? When, in the course of her laying, she gets to a wooden bar, she is directed out of her set path and evidently requires a little time to find the thread of her laying again. As often as this happens there is delay. That is why all those obstructions have been almost invariably set aside by practical men and often by the leaders themselves, who invented them. That is why so many people object to the Danzenbaker hive after using it. For the same reason, if the queen happens to locate herself in an upper story, there will be more or less difficulty in getting her back to the lower story, unless she is driven down.

There are advantages to shallow brood stories, else no one would ever adopt them. But there is no doubt that they interfere, more or less, with the full laying of the queens. This very objection to shallow stories, for brood, becomes an advantage when we consider them for surplus receptacles. If the queens happen to go into them they will dislike them for the very reasons given above.

The Ithaca Short Course

On page 60, February number, we inserted the program of this Short Course organized, like that of California, by the United States Apiary Department, through Messrs. Phillips and Demuth, at the College of Agriculture of Cornell. It will be noticed that I was booked, in this course, for an address on "The Dandant System." This subject was not of my choosing, and I would have considered it vain on my part to make the attempt of going to New York State, where so many eminent beekeepers live, and preach the "Dandant System." But as my name was thus put forward by Dr. Phillips, in connection with our methods, there

was nothing to do but go there and show, to the best of my ability, why and how we adopted large hives and an economical method of management.

There do not appear to be any better or more efficient teachers of good methods than Messrs. Phillips and Demuth, aided by such men as Dr. Rea and the list of beekeepers which were booked for the course. Everything that these men advance has passed the test of experience, sustained by sound reasoning and thorough acquaintance with the habits of bees.

I expected to find some opposition to the idea of large hives. I found nothing but concurrent statements and arguments. In fact, the train of discussion and statements led in the direction that I followed myself. So I could not speak to a better prepared audience, and was listened to very attentively.

Many influential and capable leaders in beekeeping of the East and Canada were present.

After leaving the pretty city of Ithaca and its college located in one of the most picturesque spots in the country, I had the pleasure to visit both of the Greiner brothers, long known as careful contributors of the American Bee Journal and whose portraits were given in our June, 1918, number. I also called upon Messrs. Taylor, of Newark, and Adams & Myers, of Ransomville, all practical men. On the way, through the zeal of Mr. Taylor, I had two bee conventions with a few beekeepers who kindly called upon me, during my stop at Rochester and at G. C. Greiner's home. Thanks, gentlemen, for this attention and courtesy. I certainly wish to speak of these visits more at length, but space forbids now.

At Ithaca I took a few notes of salient statements made by the leaders who spoke:

"Young bees that have never had a flight do not winter well, because their intestines are loaded with residues from their transformations from the larval and chrysalis states, which must be voided within a week or two after birth." This tallies with our experience in importing bees. The Italian shippers, at our request, tried, many years ago, the sending of queens, with freshly hatched young bees, with very old field workers and with young and active field workers. Success was altogether with the last mentioned, the worst being the young

bees that had never flown. Bees that are imported from Italy are never less than 2 weeks in confinement, oftener 3 weeks or more, and the vitality of the workers is important.

"Shall we use tartaric acid in the syrup fed to bees, to secure a change from its sugar condition and prevent a hard crystallization?" It was shown that an ounce of this acid to 15 pounds of sugar would effectually prevent any crystallization. The change from cane sugar to grape sugar is fairly brought about in the stomach of the bees, if they have a sufficient length of time to work it over. The few instances of crystallization of sugar syrup fed were evidently due to too rapid storage.

Demuth's experiments show that bees can carry a third of their weight in honey readily.

Another experiment of Demuth was on the number of trips that a bee makes to the field in a day. I was astounded to hear that the average worker makes only 4 trips. I hope further tests will be made, in the time of a bouncing honey crop.

Demuth recommends to put on supers in number sufficient to permit the evaporation of the nectar and not just for storage only. He calls attention to the fact, well-known among beekeepers, that bees arriving from the fields place their honey in any vacant cell at hand and that this honey is afterwards re-handled by the young bees, thus ripening it. If there is more room than enough there will be a greater scattering of the nectar harvested and a consequently greater ease of ripening. This is sound sense.

"It is important to shelter the underside of the hives, as well as the sides and the top, in outdoor wintering." Evidently correct. The cold reaches the bees as well from the bottom as from the sides. We forget this too often.

"If the honey crop is delayed when the bees are ready for it, it may be advisable to make increase." This, of course, must be left to the judgment of every beekeeper, and he must be guided by the floral conditions, remembering that it takes about 35 days for bees to develop, from the day the egg is laid, to the active field worker. "We must rear our bees for the honey crop, not on the honey crop."—Demuth.

"A ten-frame Langstroth hive is too small for prolific queens." This seems to be now universally granted. —C. P. D.

A CALIFORNIA PIONEER

The Interesting Career of J. S. Harbison, the First Commercial Honey Producer on the Pacific Coast

BY FRANK C. PELLETT

IN the days of forty-nine and the early fifties, California was the goal of many adventurous spirits. The discovery of gold was the cause of great excitement on the coast, and hundreds of men made the long journey from the east. Some went by way of Cape Horn, while others crossed the Isthmus of Panama on foot. The writer has always found particular interest in the events of those stirring times, since a maternal grandfather was one of the number who early went to the golden west in search of the fortune which had so long eluded him. Having heard as a child so many wonderful tales of hardship and adventure, of sudden riches and sudden death, of beans at one dollar per pound and flour at fifty dollars a sack, of Indians eating grasshoppers and white men eaten by grizzly bears, the scenes of these events held a particular fascination for me.

While Harbison did not take the first bees to California, he was the first man to develop beekeeping as a commercial venture, and the first to take any considerable number of bees. It was a serious undertaking to transport bees to California in those days. There were no railroads, and it was necessary to keep the bees confined for a long period of time. It seems surprising that it was possible to take full colonies of bees for such a long journey and get them through alive.

The total distance traveled was nearly six thousand miles. It must be remembered that there were no railroads crossing the continent in those days. The bees were shipped by sea from the Atlantic coast to the Isthmus of Panama, freighted across

the isthmus, and then came another long voyage to San Francisco and then up the Sacramento river. Mr. Harbison estimated the journey at 5,900 miles. Before going to California, Harbison had created something of a stir by selling the great total of a ton of honey, the product of his apiary at New Castle, Pa. At that time beekeeping was in its infancy and 2,000 pounds of honey was regarded as an enormous crop. According to reports, this achievement led many farmers in the east to embark in the business of honey production with more or less disastrous results. This was before the days of movable frame hives and beekeeping was more or less of an uncertain proposition. Between the disappointment of winter losses among his bees and the lure of the gold excitement in the west, Harbison decided to investigate the possibilities of California, and reached that State in 1854. The first shipment of bees, according to "Rambler," who gave an extended account of our subject in *Gleanings*, was made to California in 1853, with only one colony arriving alive.

In 1857 Mr. Harbison returned to the east and prepared 67 colonies from his own apiary in Pennsylvania, for the long journey to the Pacific Coast. The fact that he only lost five colonies on the journey bears evidence of his skill as a practical beekeeper. Another remarkable fact we learn that on his arrival, notwithstanding that bees were worth \$100 a colony, he united his weak colonies so as to make all colonies strong enough. This was undoubtedly good beekeeping, but in the face of such high prices the temptation

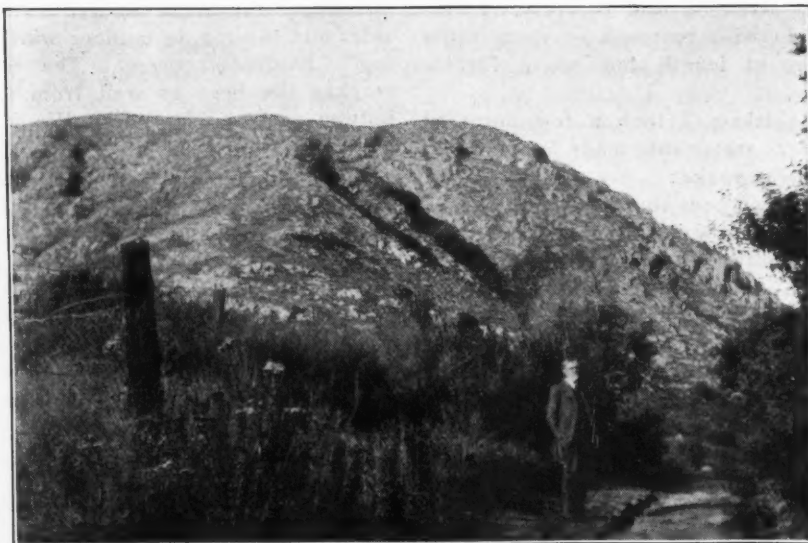
would be strong to sell the weak colonies, or at least to keep them in the hope of building them up. After the one successful trip, he went again and brought larger shipments. Of his various importations, he sold 240 colonies at \$100 per colony. Others were encouraged by his success to embark in the same kind of enterprise, and in the fall of 1858, more than a thousand colonies were shipped, but in the hands of less skillful men, the venture was not successful, and less than 200 reached their destination alive.

While on his trip east, Harbison learned of Langstroth's invention of the movable frame. While he did not approve of the hive entirely, he was doubtless influenced to make some changes in his practice as a result of it, and made what came to be known as the Harbison hive. This hive came into general use in California, but is now seldom found.

To him, also, belongs the credit of inventing the section for comb honey. According to his own statement, he conceived the idea and made the first section during the last week of December, 1857, at Sutterville, Sacramento County, California. The sections used by Harbison held two pounds of comb honey, and in the fall of 1858 he exhibited 500 pounds of section honey at the State Fair, held at Maryville. The section was afterward modified to hold only one pound, but came into almost universal use for many years.

The Sacramento Valley did not long hold attraction for Harbison, and in 1869 he went to San Diego county, where in partnership with R. G. Clark, he embarked upon the business of honey production on a big scale. The mild climate of San Diego county is very favorable to the bees and in seasons when nectar secretion is at its best, phenomenal results are secured. During the recent short course several of the beekeepers told the writer of their experiences with making increase. Miss I. Asbec in one season increased from 5 colonies to 67 by natural swarming. The bees began swarming in February. This was about 17 years ago. In 1914 Mr. J. H. Evans increased from 5 colonies to 90 by making artificial increase, and, in addition, secured a ton of honey.

It is not surprising that an expert beekeeper like Harbison, under such favorable conditions, should produce honey on such a scale as to attract the attention of the whole country. Mr. G. M. Hawley, of La Mesa, who was a friend of Harbison's for many years, informed the writer that there were 75 swarms in one day, at one of the apiaries in El Cajon mountain. Mr. R. G. Clark was in charge. With such excessive swarming, the surplus



The road through Harbison Canyon. Mr. Hawley in foreground

was undoubtedly reduced, but the amounts secured were large. In the American Bee Journal for October 5, 1889, Harbison gave an account of the invention of the section and of his shipments of comb honey to the eastern markets. In 1873 he shipped his first carload of section honey to Chicago. It was probably the first time so large a shipment had reached that market from one producer. This shipment, followed by others the next year, introduced the section to eastern beekeepers.

In 1876 Harbison shipped ten carloads at one time to New York. This was sufficient to attract the attention of the general public, and the New York Sun had an extended interview with the honey man from the west. M. H. Mendleson, of New York State, a young man much interested in beekeeping, saw this trainload of honey and was attracted to the possibilities of California for beekeeping. The big shipment of fine comb honey was sufficient to send him westward, where he has lived for many years and has, himself, become one of the best known and largest producers. The Harbison shipment totaled one hundred tons, and Mendleson has since produced a crop equal to that figure.

The interview in the New York Sun is an interesting account of the Harbison shipment and of his experiences in its production. He is credited with saying that he would not clear to exceed one thousand dollars for the entire shipment, after deducting expenses and interest on his investment. He employed fifteen men and found it necessary to move his equipment and product over rough mountain trails for many miles, thus making production and marketing extremely expensive.

When, during the San Diego short course, a trip was proposed to the site of the principal Harbison apiary in Harbison canyon, 20 miles east of San Diego, the invitation was eagerly accepted. Mr. W. H. Wineland, County Farm Advisor; G. M. Hawley, a local beekeeper; Dr. E. F. Phillips, E. R. Root and the writer composed the party. For most of the distance the roads are perfect, and we spun along over the finest paving. The road into the canyon, however, was rough and at times almost impassable. We found the surroundings much as they had been when Harbison lived there among his bees, except that all traces of his habitation have disappeared. Mr. Hawley is authority for the statement that at times he had as high as five hundred colonies in one yard and probably 3,000 colonies altogether. Our cover illustration is a picture of the mountain rising behind the site of the former Harbison home in the canyon. There is an abundance of white sage, black sage, summer buckwheat and wild alfalfa, all good sources of surplus. It seemed a little disappointing not to find any bees in this historic spot. Surely some beekeeper should find it an advantageous location even now.

As we viewed the great mountain rising behind the site of the former

Harbison home, it was suggested that this should be Harbison mountain. Mr. Wineland volunteered to look the matter up and ascertain whether it had ever been officially named, and if not to convey to the authorities the wish of the entire party that it be named after the famous beeman who lived and labored beside it for so many years. We have since been informed that the mountain had not been previously named and that the authorities have seen fit to act on the suggestion and call it "Harbison Mountain." The canyon had long been known as Harbison Canyon.

About Inspection

I NOTICE what is said about foulbrood laws in the February number and also what is said about the Texas law in the January number. I would not advocate such a stringent law as Texas has, but unless we have something that will compel careless beekeepers to clean up, the law is largely a dead letter. I think we should have an inspector and deputies where needed and when disease is found, for the inspectors to clean up, or see that it is done. Many will not try, and many do not succeed when they do try. For an inspector to find disease and leave instructions and then go away with nothing done, does no good at all. I do not think there are 10 per cent of the number of bees in our county there were before foulbrood got a start, and I think this is true in a great many other places in our State.

J. W. ROUSE, Mexico, Mo.

The fortunate thing about foulbrood is that it does not put good beekeepers out of business. It is very inconvenient, causes some trouble and expense and a lot of annoyance. However, expert attention makes it possible to keep the disease under control and at the same time harvest some honey. This being the case, the problem resolves itself into making good beekeepers wherever the dis-

ease is present. Many very successful beekeepers date their success from the time when they began to fight foulbrood, and in some cases both American and European foulbrood are present. The writer could name some of the most successful beekeepers who make a business of harvesting big crops who are constantly fighting both diseases.

The fact of the matter is that in localities where principal stress has been paid to police power the beekeeping has declined, whereas in States where more attention has been given to education by the inspection force it has been built up in spite of the presence of disease. The fact that the business has improved in the face of disease, where educational methods are in operation, and has not done so by the police method, is a very good argument against the continuance of the old plan. In most of the States the tendency has been more and more toward educational methods for some time, and some States are abandoning quarantine methods entirely. While there should be sufficient law to prevent a man from continuing to expose his neighbors' bees to disease, needlessly, there is no justification in continuing the general practice of quarantine methods after a disease has become so generally diffused that there is no longer any hope of eradicating it entirely. Since educational methods have proved most effective, while at the same time accomplishing far more for less money, the interests of the beekeeper can apparently be better served by extending the new plan.—F. C. P.

Bluevine or Climbing Milkweed

(Also called Anglepod or Shoestring Vine.)

By E. A. Ragland.

YOU wanted to know about this vine and its nature. Well, I will say it comes up early in the spring a long, straight shoot at first and when it is about 2 feet high two



A group of beekeepers at the site of Harbison's former home

leaves something like a sweet potato plant come on at each joint. The joints and leaves are about 6 inches apart. It seems to grow best on low lands, but will grow on high hill land. It will run as far as 60 feet on wire fences. I noticed one on a guy wire to a telegraph pole that was at least 40 feet high. It begins blooming about the first of July and blooms until about the tenth of September. However, the bees do not pay any attention to it until about the latter part of July or the first of August. From then on, as long as the blossoms last, the bees hum after it. There are one or two clusters at each joint, something like basswood. The blooms are small, white, and range from 15 to 250 in a cluster. The vine is very small, about the size of a baling wire, and about as tough. This plant seems to do best dry years. The honey is about the color of Colorado alfalfa, but seldom seems to granulate, and has a very fine flavor. Nothing equals it, in my opinion. The seed pods begin forming in August and stay green until in November. The pods are almost like those of the milkweed. The seeds are also. They have a kind of cotton on one end. As soon as the pods are dry they split open and the seeds blow out and fly for miles. I have seen them 200 feet high. They remind me of cobwebs late in October.

Dr. Phillips, of Washington, D. C., was here last May and I was telling him about the plant. He said it produced carloads of honey in southern Indiana. There was a cornfield here of 1,200 acres and I don't think there was a stalk that did not have a shoestring vine on it. Dr. Phillips said they called it shoestring vine in Indiana, but he did not know the botanical name for it. I will enclose a small seed pod and a piece of vine. If you can figure out a name for it please let me know, and if it is so you can come over in August you can then see just what the bees think of it. You can smell the sweet odor for half a mile when the wind is just right.

Brunswick, Mo.
(Dr. L. H. Pammel identifies the plant as *Genolubus Laevis*. It is common in Southern Illinois, Indiana and Ohio, where it is a persistent and troublesome weed. It also occurs in a few localities in Southern Iowa. We have numerous reports of this plant as an important source of surplus honey.—F. C. P.)

More About Shoestring Vine

This plant belongs to the milkweed family and "Bluevine" is only a local name for it. It grows rampant in the river bottoms of Southern Indiana, but does not seem to thrive on upland or thin clay soils.

It is my main stay for a white honey crop in the fall, and the honey excels white clover in beauty and taste. Mr. E. G. Baldwin, of the U. S. Department, has told me that some of the beekeepers in the extreme southern counties report a yield from this vine of 80 pounds in two weeks. I do not doubt this in the least. I just commenced taking this

honey off today, October 2, 1918, and it will average 60 pounds per colony in three weeks.

The plant is a pest in the cornfields, as there is no killing it out, and the moment the cultivator stops it begins to climb the cornstalks. It has a string of miniature white flowers all along the vine and keeps blooming as it grows. I have seen it run up the brace wires of the telephone poles for 15 feet. It begins to bloom about August first and seldom lasts more than three weeks.

S. H. BURTON,
Washington, Ind.

Long Idea Hive with Supers

YOUR discussion on "Deep vs. Langstroth Frames," in the February number of the American Bee Journal, is very interesting, also your comment on the story-and-a-half hive.

What you say of the Danzenbaker hive is true, at least I have found it so. A single Danzenbaker brood-chamber is too small for even an ordinary queen, and I have been compelled to provide two-story brood-chambers for some that I have had.

I found this brood-chamber with its two sets of frames an unmitigated nuisance, and do not intend to use it next season.

I have gradually transferred my bees to Langstroth frames, and I am now building a number of the "Long Idea" hives. These hives are designed to hold thirty-three Langstroth frames and are arranged to take 10-frame hive-bodies as supers. I also intend to use these hive-bodies as winter cases, packing the bees in 10-frame Demuth cases, then placing them in groups of three, using three of the long hive-bodies tiered up for an outer case. I have planned to provide one cluster with an entrance in the end case, facing east; the other two entrances to be in the sides, facing south.

I have decided upon the "Long Idea" hive because it seemed to be the only way to enlarge the brood-chamber without abandoning the frames I now have.

As mine is only a side-line apiary, I am not always at liberty to give my bees the attention they require, such as enlarging the brood-chamber, cutting queen-cells, etc., things which seem necessary when the standard size brood-chamber is used. Do you think that expanding the brood-chamber laterally, as in the case of the "Long Idea" hive, will give results equal to those obtained with your Dadant-Quinby, or the Jumbo brood-frames?

I should like to have you answer this in the next issue of the American Bee Journal.

A. W. LEE, Tarrytown, N. Y.

(Experiences vary, and some people are pleased with things that others dislike. But my personal experience with the "Long Idea" hives was not satisfactory, though I am free to say that I would rather use them than the narrow brood-chambers, such as the 8-frame Langstroth.

The main trouble which I found with the long-idea hives is the ability of the queen to travel all over it and lay her eggs first at one end and then at the other, thus changing the location of the brood-combs. In this way we may find brood in any part of the hive at any time. When we extract there is always trouble in getting a sufficient number of combs free from brood, although the hive may be well stored with surplus.

Another trouble is in removing the honey for extracting. There is no way to exclude the bees as we do when we place a bee escape between super and body. So the combs have to be lifted out and the bees brushed off. This always enhances robbing.

For these reasons, we have discarded the "Long Idea" hive from our apiaries, after several years of trial.—C. P. D.)

(When used with supers as Mr. Lee suggests, I would expect rather satisfactory results from this arrangement. The "Long Idea" hive discussed by the editor was used without a super, thus requiring that frames be lifted from the body for extracting. As Mr. Lee will use it, there need not be much manipulation, since there are only 21 frames in the body. I have seen a similar plan tried with 17 frames and two 8-frame bodies side by side, for supers, with good results.—F. C. P.)

Marking Queens

By D. Queen

IN your January issue I observe an inquiry in regard to marking queens. Something like four years ago I became interested in this matter, but could find no information as to the method or the means to be used. I finally worked out the details, which proved satisfactory and practicable.

The "paint" is simply shellac dissolved in grain alcohol—preferably white shellac, although not essential. The coloring matter may be orange chrome, red lead, zinc white or any non-corrosive pigment in dry powdered form. Experience gained by experiment will soon show how much coloring pigment to mix with the shellac, also how thick the shellac should be. My outfit was made up of two small vials holding, say one-half ounce, and a small camel hair brush about the size of the lead of a pencil when it needs sharpening. These vials were set into a bit of inch board about 3 inches square. The brush was set through the cork of the shellac bottle a la mucilage, and dipped into the shellac far enough to charge the brush.

I personally object to handling queens, therefore my marking and clipping is done while the queen is upon the comb.

If these operations are done early in the day, while the air is rather cool, I find no difficulty.

This autumn I pinched the head off a marked queen, this being her third season, and still going strong, but not considered dependable for the work of building up in the spring.

Six were marked at the same time, and no effect was noticeable in the behavior of the queen or the bees. This queen was prolific this season and had a strong colony, but it stored a surplus of only 21¼ pounds. I was very enthusiastic at the time about marking queens, but realized that marking does not take the place of the clipping, and I finally decided that it was not worth the trouble.

Practice on drones or workers before attempting queens.

New Jersey.

Honey From Tobacco

In my first year in Porto Rico I noticed one morning that the bees were bringing in nectar abundantly. I traced the bees about half a mile and found them working in a tobacco field of about an acre or two. On my way I passed lots of tobacco in

bloom without seeing a bee working on it. The particular field where the bees were busy had been neglected and was full of grass and weeds and the tobacco plants had suffered, the leaves and blooms hanging down, while in the adjoining fields which were well worked, the plants looked fresh and the flowers stood upright.

HENRY BRENNER, Seguin, Tex.

Nothing New Under the Sun

In the October issue of the American Bee Journal a feeder is described under the heading "A New Feeder." It is now some 40 years since I designed or invented a similar feeder and gave a description of it in the British Bee Journal. A good thing, but it did not "take on."

A. D. CAMERON,
Druimchruid, Scotland.

BEEKEEPERS BY THE WAY

Migratory Graham

There is no more interesting character on the Pacific Coast than Migratory Graham. Known and feared from the Canadian line to the Mexican border, no man moves more frequently or has a wider beekeeping experience than he. Beginning his career in San Diego County at the age of 15 years, he has kept bees in 32 California counties and in five valleys of Nevada.

Wherever beekeepers congregate one hears tales of the exploits of Migratory Graham. According to his own statement he has shipped 161 cars of bees. When one stops to consider the labor of preparing and shipping a car of bees it seems amazing that one man should live to carry on the shipping of bees on such a scale. This would mean an average of eight cars a year for twenty years.

Graham figures that by frequent moving one can get several crops a year in California. As a typical example of the possibilities in this direction, he suggests building up in spring in the almond belt of Butte or Colusa Counties. From here he would move to the orange in Tulare County, then back to the Sacramento

or San Joachim Valley to the domestic seed belt. From here he would move to Northern California for an alfalfa flow, and then south again for Jackass clover.

Graham has had more ups and downs than fall to the lot of the average man who aspires to do things on a large scale. At one time he had 3,000 colonies of bees and the best equipment on the Pacific coast and produced a crop of 240,000 pounds by the practice of migration. From that he has reached the other extreme with neither bees nor equipment, and is now again on the up grade with 600 colonies.

Graham has been freely charged with spreading foulbrood all up and down the coast and has been the target for much violent criticism. Special ordinances have been passed to keep him out of special territory and he has been arrested and fined times almost without number. When the writer enquired how many times he had been arrested for violation of ordinances, he replied that nobody knew.

Neither ordinances or quarantines, fines or imprisonment have been sufficient to keep him from moving, and the beekeepers of a favored locality are often surprised on going out some morning to find a big apiary offering its competition for the honey-flow. However, he seldom remains long in a place, and as soon as the flow is over he leaves as mysteriously as he came.

Migratory Graham is undoubtedly one of the most capable beekeepers of the time, yet his life has been far from a pleasant one. Few men are more adaptable than he is reported to be. It is said that in the days of his prosperity he dressed the part of a gentleman of leisure and would readily have passed for a foreign nobleman with his high hat and cane. In days of adversity he can play the part of a tramp and make himself comfortable with the barest necessities with equal ease. The world may never see his like again.



A famous migratory beekeeper

Does Corn Produce Nectar?

NOTICE that this subject is now coming in for discussion in the American Bee Journal, and I will offer some thoughts on the subject for what they are worth. I have been keeping bees ever since I was 14 years of age and have always been advised that common Indian corn or maize does not produce nectar. The fact of the matter is the botanical rule holds that all plants that are wind pollinating do not produce nectar, while all the plants that are insect pollinating do. I think that this will hold good as a rule in corn, as it is one of the wind pollinators. My observations show for many years that bees do not work on corn for honey, but do so for pollen. I have seen the bees working on the silks of corn many times, and have good reason to believe that they gather some little sweet substance therefrom at times, but in so slight an amount that it is not worth while to mention. I have seen the bees picking up pollen from the silks of the corn on two occasions, and one year I saw the bees gathering aphid secretions from the corn. I know that this was true from the fact that much of the corn had a goodly amount of aphides (lice) on it. It is my observation that bees do not gather honey from corn to count at all. I must say in this connection that it is easy to believe that bees gather honey from corn, since there are many honey-bearing plants that are producing at the time corn is at its best. As a pollen-producer the corn cannot be excelled, sometimes. During the latter part of June and the first part of July, 1917, I witnessed the greatest collection of pollen from corn that I ever saw. We had a great drought here in Texas at that time and the corn just bunched to tassel. About half of the corn pushed the tassel about half out of the boot and stopped growing suddenly. The tassel was well enough developed to produce pollen, and as the blades of corn formed a funnel around the tassel the pollen fell into this funnel and lay in heaps, sometimes more than an inch deep. At this time there was nothing for the bees to do but gather the pollen, and my bees put in great slabs of this pollen. It was so dry here that all other vegetation had dried up and there was not an ounce of honey in the country, but about ten days later the cotton began to give a faint tinge of honey. These conditions continued until in September, when a few light showers came and a little honey came, so that the bees could gather enough for winter. We thought that these fearfully dry conditions would cease at the end of 1917, but they continued all through 1918, and we had a repetition of the corn conditions of 1917, but had more honey in the cotton, and the bees did better. Neither of these years showed that bees gathered honey from corn.

T. P. ROBINSON, Bartlett, Tex.

A New Yorker's Observation

I have seen bees on both tassels and silks, and have also seen them

work on the stalks, sucking the juice from the corn wherever a stalk was broken or cracked, and I always thought that they took the sweet juice from broken stalks and converted the sugar to honey, and I know that my bees gather a large amount of pollen from the corn tassels.

GAROLD PETTYS,
Chase Mills, N. Y.

A Word From Missouri

I will answer your inquiry in regard to "Do Bees Get Honey From Corn?" I think that I know some thing about that. I was raised in a corn country and have been a keeper of bees for several years. A great many times the honey flow would be short about the time Indian corn would tassel out. I always thought when the Indian corn tasseled out and silked that my bees would be all right; but I was sadly disappointed. By close observations, which I conducted many a morning, I would find my busy little Italians going to and from the hives, working very hard in a near by cornfield; but on examining the hives I would find no nectar and worlds of cream-colored pollen; so that convinced me that they do not get anything off of Indian corn but pollen.

P. J. CRAFT, Liberal, Mo.

From Georgia

"Do Bees Get Honey From Corn?" You asked the readers to answer the question. My answer is they do not get honey from corn; they do get pollen. I have ten outyards in a rich corn section, big swamp land and rich loam made or covered bottom land, and if it yielded honey I would get some. I do get honey at that time which comes from the button-wood bush, also from the marsh lily or a marsh flower that blooms at the time that corn is in tassel; it is a low grade of honey. I used to believe that it came from corn, but a search proved that it did not.

W. L. WILDER, Macon, Ga.

Wisconsin Says No

Replying to your query as to bees gathering honey from corn, will say I believe for the past 40 years I have been as close and careful an observer as anyone, and I have the first time yet to see a bee working on corn silk or any other part of corn excepting the tassel, from which they gather pollen in large quantities.

So sure am I that they do not get honey from it at all, and notwithstanding the reports of bees storing large quantities of honey from corn tassel, I will pay \$1 per pound for a 60-pound can of pure corn tassel honey. Now don't all you corn honey men run and rush in your crop, as you may swamp me.

ELIAS FOX, Union Center, Wis.

A Word From Texas

The tassel of the corn yields pollen early, and some honey later on. If the weather is favorable for the reproduction of plant lice, we may always expect them to attack the tassel, making the top leaves "sticky" and discolored. I have seen bees pile on the tassel until you could scarcely see anything but the bees gathering this honeydew. The honey thus ob-

tained is dark, but of very fair flavor.—Wm. R. Howard, White Rock, Tex., American Bee Journal, page 225, May, 1880.

"Springing" Bees

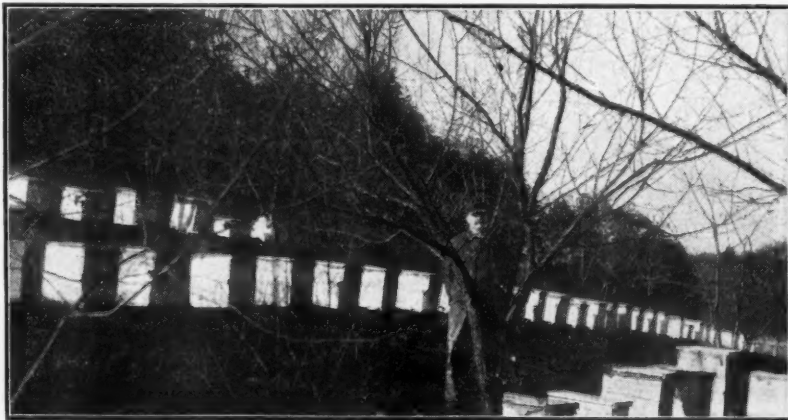
By D. A. Macdonald

MUCH has been written about wintering bees, as the pages of all bee papers, year after year clearly testify. Less, too little space, has been devoted to the subject of "springing" bees. Yet on nothing else does success or failure more strongly depend. With the advent of spring the cares and worries of bees and beekeepers manifest themselves. Hitherto the winter cluster kept warm and dry, with plenty of bees and ample stores, the problem has been a simple one. Henceforward it will become more and more complex, because so many side factors intrude. Happy now are all who did their spring stimulation in autumn, who fed their bees with abundance of stores well matured, well made and well sealed, for they can now fold their hands and feel calmly content. Stores present, a good queen heading the colony, plenty of young bees breeding will go on apace. Early in spring, sometime in February, the brood area will be small, at first only a tiny patch or two on the central frame. No anxiety need be felt as yet, for this is the natural routine of each successive spring in every hive. With March, however, activities develop at a different pace in different localities, depending principally on various altitudes, and different degrees north or south of the Equator. Many side factors arise—the bees, the queen, the quantity and quality of stores, the available supply of pollen, the nearness of the water required, all affect results beneficially or prejudicially.

Here, at the very outset, we find a sharp cleavage of both opinion and practice over this problem of "springing" bees successfully. One set of advocates preaches the doctrine of "let 'em alone," holding that right through the spring months of February, March and April bees are best left to their own devices, and that the prescient little worker bees of the colony know what is for the

present best interests and future well-being of the community as a whole. Given, they say, ample stores, 30 to 40 pounds in late September, to be well matured and carefully sealed in early October, left under the care of the bees in a well-made hive, and you have the very best provision and guarantee for bringing each colony safely through not only the winter months, but also the three succeeding months of spring without any outside aid. Not only that, but they contend any interference would be detrimental to the bees. They, in their spirit of forethought, have so arranged their stores and their brood-nest that everything is in apple-pie order for even the severest winter and early spring. The beekeeper's meddling, they contend, would not work for good, but evil. Interference from outside would break up the cluster, disturb the quiet and orderly arrangements presciently maintained by the "spirit of the hive," while the agitation produced would prematurely encourage a start in breeding, thus producing young bees untimely, with all the consequential drain in stores, premature search for both heat-forming and flesh-forming food for the nourishment of the young larvæ. The search for water, too, overtaxes the strength and endurance of the diligent workers, and they age before their due time. One of the most earnest advocates of the first system of spring treatment has summarized the whole procedure in the graphic phrase, "millions of honey in our house," and another leading light, still with us, says, "The most satisfactory way of stimulating brood-rearing, for me, is to see that the bees have plenty—yes, more than plenty, abundance—of stores in autumn, and then leave them entirely alone. Queens do their best without the lash."

Those who preach and practice stimulation in spring are fully as confident and enthusiastic in commending and advocating their own special tenets and doctrines. Bees, they contend, want a rousing up in spring, a sort of that shaking up whose beneficial influence is pleaded for by many successful beekeepers in many lands. Therefore, they start in spring to stoke the bees in their desire that they should stoke the queen.



Apiary built up from colony caught in bee-tree. Fred W. Krome, Black River Falls, Wis.

They force the pace, and seek to accelerate the energies and desires of the queen for ovipositing. Jog trot procedure is not for them, even the speed of an express train is too slow, and they wish to hurry on at the rate of an aeroplane. If seasons were always good, if supplies were always available, if queens could last forever, this would be an ideal procedure—perhaps. But seasons are variable, the flow of nectar uncertain, and so checks, hindrances, deterrent influences, intervene, making frequently the last state of the stimulated stock worse than the first. The colony attains the crest of the wave at too early a date, the big battalions reach the maximum before nectar is to be had in anything like a copious flow. If there is any one golden rule in apiculture more valuable than any other it is this: Bees should be at their strongest just when the flow is at its best. The two should synchronize as to time. A week too early or too late may mean that the bees have missed that tide which, taken at the flood, leads on to success.

I am not personally a strong advocate of either of these extremes. I certainly don't belong to the stimulative party, but I would not strongly advise to let the bees severely alone. Rather seek for and find the golden mean between the two extremes. Bees are all the better for the guiding hand of their owners in spring, then perhaps more than at any other season of the year. The iron hand in the velvet glove may be too harsh a simile, the moral suasion which guides and directs without manifesting its presence might be better. Early, very early, discover if the bees are all alive, if stores are holding out, if breeding is in satisfactory progress, if the interior guarantees the community is warm and dry.

Few will dispute that the less agitation created early in the spring, the better it will be for the welfare of the community; but when milder days arrive, when honey is available

even in dribblets, one can safely expedite matters gently and steadily, both in and out of the hive. Inside a slight scratching or piercing of comb-cappings, near the brood-nest, occasionally leads the bees to think that they have a supply of easily available stores to keep the queen laying steadily. Outside, a supply of artificial pollen will still further encourage brood-rearing. This works for good and not evil. There is practically little or no sudden rousing of the bees, little disintegrating of the cluster, little disturbance of the brood area. Bees near the bleeding honey quietly transport it to the combs frequented by the nurse bees and they stoke the queen, not unduly, and so bring on brood-rearing.

No hard and fast lines can be laid down. What applies to one man does not apply to another. What applies to one season only partly applies to another. In particular, what applies to one altitude, or degree of latitude, must be modified and varied when applied to another. Herein lies a fertile source for discussion of this thorny subject, the best way of bringing bees safely through early spring.

Banff, Scotland.

Gassed Soldiers Raising Bees

By J. W. Harting

BEE raising offers to the gassed soldier or the man broken in health from the hardships of trench warfare a profitable occupation. Based on an original gift of 20 hives by the American Red Cross, bee raising as an employment for soldiers recovering from wounds or fever, is being developed in the vicinity of Verdun, where reconstruction is receiving expert consideration. The gift was made to M. Grillon, the sous-prefect of Verdun.

The Friends' unit of the American Red Cross, which is doing this specific work, hopes that in a few

months it will have enough bees for everyone who kept bees before the war. The Friends are also helping to run dairy farms, hospital and health exhibits and have put up refugee barracks. They have created communal gardens and are arranging to equip the farmers who are beginning to return to their land. A central base has been established on the farm of La Grange-le-Comte and there is being developed at Vanault-les-Dames, in the Marne section, a stock-raising farm where chickens, rabbits and pigs are being raised and where some sheep, horses and cows are also being kept for future distribution in the Argonne region.

The work of raising bees conforms well to the needs of the man unfit for the heavier agricultural work, and therefore every encouragement is being given the industry by the Red Cross.

The Dignity of Beekeeping

By Mrs. Armstrong Allen

PEOPLE who live in cities easily acquire habits. (Living there myself, I know.) People who live outside of cities have habits, too, but being quite different, they can scarcely be used to point the same moral or adorn the same tale. The particular habit haunting this particular beekeeper today is characteristic of a large, though possibly decreasing, class in cities and towns. If it is decreasing, the happy change is doubtless due to the war, the one great recent maker and breaker of habits.

Only too long it has been the way of business men to smile at the mention of rural pursuits, country occupations. Some smile broadly, openly, frankly, and often in friendly wise—yet they smile. Others smile ever so slightly, with just their eyes perhaps, or the ends of their lips—maybe only one end—still they smile. While still others, eyes and lips more careful servants, may show no sign at all—yet they, too, smile, inside. Farmers and gardeners, dairymen, poultrymen and beekeepers, have felt this, and resented it, for generations. I remember having heard a man of education and scientific training, a teacher of chemistry, speak of it—Dr. J. S. Ward, for several years our State inspector. "It makes me three-thirds mad," was what he said one day at a beekeepers' meeting, "it actually makes me three-thirds mad to see the look some people get on when I speak of beekeeping." It was that same smile—that same city habit.

Yet, after all, there is nothing more serious back of it all than a superficial misapprehension, a little lack of information. The man who, when beekeeping is mentioned, puts on a look that makes the educated beekeeper three-thirds mad, just does not understand the status of beekeeping. We who do can well afford just to smile back—a different kind of smile. For beekeeping is not a cheap or crude or insignificant thing



Grace Allen in her apiary

to do. It is important in the life of the people, and it is dignified. To think that a factory is more important than an apiary, or a manufacturer more dignified than a beekeeper is a mistake. The boasted high efficiency of up-to-date industry is something new, something modern, something smacking of the Nineteenth and Twentieth Centuries. The efficiency of the hive is old, even classic, linking itself with the days of David and Solomon, or Virgil or Aristotle. And to an efficiency like unto that of the hive does the beekeeper himself aspire. The roar of the city is something to hurt both ears and souls. The hum of the hive is of the very stuff of quietness, and peace and poise.

Sometimes it seems as though perhaps the words beekeeper, beekeeping, may be part of the trouble. Perhaps, if we care much for a greater show of respect from those who are steeped in the ways and the phrase of the marketplace, we should be to them always as the moon is to the earth. Show them only one side, and let that be the business side, the side of the honey production. Call yourself a honey producer, and see if that doesn't help. It utterly changes the picture. Say beekeeper to me, for instance, and I see the most charming things—white hives on green grass under the trees, probably in an old orchard. I have even a queer trick of putting a lovable old man into the picture, an old man full of rich philosophies, doing things quietly and a bit leisurely. Of course, that is really absurd, because it has been given me to have a wide enough acquaintance among beekeepers to know that they are not always lovable old men! If one who knows somewhat of the beekeeping world thus unconsciously persists in inaccuracies in a generalized picture, may not our friends of the factory and the countinghouse do the same? Say beekeeper to them, and who knows what they see? Probably they conjure up a mental picture of a few neglected old "gums" presided over by a backwoodsman or a hill billy. So they smile. As we do, also, at that particular picture.

But say honey producer. Immediately I lose my nice old man under the orchard trees, and the man of the marketplace, loses his hill billy with the bee gums, and we both see strong, up-to-date, keen, energetic men loading a food commodity into a car. And the man of the marketplace ceases to smile, for here he sees the very qualities to which he bows with respect—alertness, good management, hustle, modern methods, success.

But whatever we call ourselves, beekeepers or honey producers, whether people who live in cities smile or salute, we may rest quietly on the realization of the genuine dignity of our work. It is a work that uses hands and brains—and hearts. It has brought no problems to add to the increasing complexities of mod-

ern industrialism. Labor has no long score, no aching grudge, to settle with us. Bolshevism grows neither from our ranks nor as a reaction against us. And we are producers of a foodstuff of real value. Moreover, no store or bank, not even the boasted sunlight factories, could be made as hygienic as our apiaries. The worthwhile beekeeper keeps them so. It was God made them so, in the beginning. And to the wholesomeness of His air and sun, he added bird song and the beauty of blossoming things and the indescribable charm of the bees themselves—that old charm woven of swift wings and mysterious ways and the most soul-resting sound in the world.

In My Beeyard

I wish the maddened, saddened world
Could sit down here with me
And look away across the day
And see the things I see.
No splendid vista there would show—
Just beehives in a quiet row,
And the blue beyond the tree.

But Oh, while you're sitting and looking
Across the hives to the blue,
From somewhere softly stealing
Comes over you the feeling
Of old dreams coming true.

I wish the tired and tortured world
Could come from east and west
And hear the bees beneath the trees
Returning from their quest.
'Twould heal the very soul of them,
The worn and weary whole of them,
And give them utter rest.

For Oh, while you're listening quiet,
Beneath the bending trees,
From somewhere softly blowing,
The peace of God comes flowing
Right through the humming bees.
Nashville, Tenn.

Texas Inspection Meeting

The Apiary Inspectors of Texas met in College Station on January 24 and 25. This was the second annual meeting held under the new plan of co-ordinating the efforts of the various County Inspectors into an Educational force under the leadership of Mr. F. B. Paddock, State Entomologist.

In the forenoon of Friday, Mr. H. B. Parks, of the Extension Department, outlined the work now being done in educating the box-hive beekeeper of the more backward developed counties to adopt modern methods. The Extension Department and the law enforcement agencies are now working together along the lines of awakening interest and enthusiasm in beekeeping.

Professor S. W. Bilsing outlined the work of his class in beekeeping at the A. & M. College, and at the final meeting of the inspectors demonstrated by a visit to the College apiary, the work of the boys in his class.

More flexible and sensible regulations were adopted covering the shipment of honey from and into quarantined areas. The rigid regulation heretofore in effect had been found unworkable and a form of certificates to accompany future shipments was adopted that will tend to place more responsibility upon the producer himself and awaken him to a realization of the possible dangers of shipping infected honey.

Strong representations were made to the State Legislature now in session looking toward the establishment of State Experimental Apiaries for the study of beekeeping under Texas floral and climatic conditions. Since this meeting a bill has been introduced in the Legislature providing \$6,000 for the establishment of these apiaries and for the expenses of maintenance and operation.

E. G. LESTOURGEON.



Texas Inspectors at College Station

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to
Dr. C. C. MILLER, MARENGO, ILL.
He does NOT answer bee-keeping questions by mail.

Black Beeswax

I have a chunk of beeswax which is as dark as pitch. I have melted it in a sunwax extractor; also have melted it with hot water, but the color remains unchanged. What process is best to refine wax?

ILLINOIS.

ANSWER.—I do not know, unless you use acid. If there's any better way Editor Dadant will know it.

(You do not say how it was blackened. If it was by the use of a rusty kettle, it will be hard to bring it back to good color. You might succeed by melting it several times in the sun extractor.—Ed.)

Package Bees

I have recently sent an order for 25 2-lb. packages of bees with queens to be delivered about the 1st to 15th of next June. What would be the best plan for handling these bees? I am using 10-frame Langstroth hives. Could I put in full sheets of foundation and have them on two or three frames with a division-board, feed them awhile and gradually increase the broodnest and get them built up to full colonies by fall, so as not to require feeding or doubling up for the winter? The yellow sweet clover generally begins blooming here about the 10th to 15th of June, and alfalfa about the 15th to 20th of June, and hay harvest begins the last week in June, sometimes the first week in July, and swarming season the middle of July to 1st of August. I have read your books, but they say very little about handling bees in packages, and most of your increase was made with fully drawn combs, and not with foundation.

WYOMING.

ANSWER.—Yes, you can do as you propose, putting the bees on three frames of foundation with division-board and gradually enlarging; but if weather is hot it is doubtful if it will be worth while to use the division-board. Neither will it be worth while to feed if the bees get a reasonable amount of honey from the field so that their combs are never without honey. A package of bees with queen is to be treated just as you would treat a swarm, and you will probably find no difficulty in the management. You say I had drawn combs in making increase. Well, foundation would be the same, only the bees will get along a little faster with the comb. So far as you have them to spare it will be well to give combs of honey, giving one to each nucleus, and frames of brood and honey will be still better.

Finding the Queen

I want Dr. Miller to tell me through the Journal—because I believe others would like to know the same thing—how to find the queen in a hive. I have had bees for five or six years and have found one on one or two occasions, and have been unsuccessful on occasions too numerous to relate.

OKLAHOMA.

ANSWER.—There's no trick about it, and if you keep on trying to find queens, most likely you will wonder that you ever thought it hard. Use as little smoke as possible, for if you smoke so much as to set the bees running it's all day with finding queens. But smoke enough to keep the bees in subjection. The queen is nearly always on the brood; so lift out the frame or frames at the side until you come to the first frame with brood. When possible, sit with your back to the sun, so you can see better. As you gently lift out the comb keep watch for the queen on the side of the comb next to you, but as soon as the

comb is lifted out examine carefully the other side, and then return for another look at the side next you. Continue in this way till you have been over all the combs, and if necessary repeat the whole performance. If you do not find her on the second time going over, you may save time by closing the hive until an hour or more later, or until the next day. Handle the combs very gently; a jar is as bad as too much smoke. My assistant is an expert at finding queens, and I've given you her way.

Transferring—Packing

1. I have three colonies of bees which I purchased late last fall, and as we had a poor flow, did not transfer them, but would like to early this spring. Would it do for me to drum them out of the old hive about first bloom time into another hive, then set the new hive above the old one with a separator between them? Would this hinder brood-raising to any extent?

2. I packed my bees last fall in individual packing cases with about 6 inches of leaves all around, then I put burlap in the bottom of super and filled it with leaves, leaving the hive top off. I filled the packing case on up, this making about 12 inches of packing above the bees. Then I put on the top of the packing case, which is covered with tarred paper. I then bored two 1-inch holes just below the roof for ventilation. The hive sets about 6 inches higher than the bottom of the packing case. I put the opening of the packing case at the bottom and put a slanting chute from the hive entrance to the packing case entrance. Will that help the bees any to keep the dead bees out of their entrances? Packing case entrance is three-eighths by 4 inches. Hive entrance three-eighths by full width.

3. The dead bees seem to come out fine and the bees seem to be doing just fine. We have had two or three warm days here of late and every hive has taken one day's flight. They looked like they would swarm, they were out so thick, but up till then they have never been out that I know of, and I find very few dead bees at the entrances. Don't you think that would indicate they were doing well?

ILLINOIS.

ANSWER.—1 I think not.

2. I suspect it would be as well if you had bored only one hole instead of two. That slanting entrance would make it at least a little easier for the bees to keep the dead bees cleared away.

3. You would be hard to please if you were not satisfied with their behavior. Still, you have not reached the time of greatest mortality, your letter being dated January 10. You will probably find that more bees will die in the last month of confinement than in all the previous time. They are evidently wintering well.

Size of Frames—Packing

1. I am a beginner in beekeeping. I expect to work for extracted honey. As all frames in the apiary should be the same size, what hives and what size frames would you advise me to get? Some say the queens will lay more eggs in large frames than in small ones.

2. What size pocket honey extractor would you advise me to get?

3. Can a 9 1/4-inch frame be successfully extracted in a 12-inch pocket honey extractor?

4. What is the best to put over the brood-frames, straw mats, oil cloth, or just the cover alone?

5. There is no rye straw around here. Could mats be made out of timothy hay?

6. When do you examine your bees for the first time in spring? Do you examine them at their first flight, or do you wait two or three weeks later?

7. Do you disturb your bees on warm winter days to make them fly?

8. I have often read: Dark honey should

not be left in the hive in fall, as it causes dysentery. How about buckwheat honey?

IOWA.

ANSWER.—1. Some agree with the Dadants that it is better to have extraction frames shallower than the brood-frames. You will do well to have 10-frame dovetailed hives, unless you have the Dadant. Like enough queens may lay at least a little more in large frames.

2. That depends on the size of your extraction-combs. The pockets should be at least large enough to take the frames easily.

3. Yes.

4. As you appear to winter outdoors, you should have straw mats or something to take their place.

5. I'm afraid not. Leaves are excellent for packing.

6. Sometimes on the day they are taken from cellar, but usually not till some warm day a week or more later.

7. No; because I winter in the cellar.

8. Buckwheat honey is good for wintering.

Insulating Materials

On page 24 of the January issue is an interesting table of the relative insulating value of a few packing materials. Where, in your judgment, would hay and straw, nicely packed, stand in this list?

NEW YORK.

ANSWER.—I don't know, but should think it would come in between dead air space and corrugated cardboard.

Swarm Control

1. I have three stands of bees in 10-frame hives. Two stands are blacks and the third I requeened last spring with an Italian queen. I wish to limit them to 4 stands, total, next spring, and intend to let my strongest blacks swarm, but intend to clip the queens of the other two early, and then kill them when they come out to swarm. What better way would you suggest that will give me my objective and still keep the bees happy? My bees are located on a small town lot.

2. In what way would a change of next season, from normal, influence these plants?

INDIANA.

ANSWER.—1. When a colony swarms and you kill its queen and then leave it to its own devices, there's hardly anything surer than that it will swarm again in a week or so. You may avoid this if you kill all cells but one.

Perhaps you might like to have all Italians, and this might suit you: Call the Italian A, and the two blacks B and C, and let them stand thus:

A B C

Strengthen A by giving it frames of sealed brood from B and C, with or without adhering bees. That will make A swarm first. When it swarms, set the swarm, which we will call D, in place of A, put A in place of B, and set B on a new stand, thus:

D A C B

In perhaps eight days A should swarm again, when you will put the swarm E in place of A, put A in place of C, and put C close beside B, thus:

D E A B C

When A swarms again, put the swarm F in place of A, and put A close beside B and C, thus:

D E F B C A

A week later kill the queens of B and C, and four or five days later kill all cells in B and C and pile them on A. Thus you have your four colonies with an Italian queen in each.

2. A season might be so poor that the bees would not swarm.

Drawn Combs for Swarms

1. If, when a colony swarms, a hive full of drawn combs is given, will not the bees immediately fill them with honey and soon crowd the queen very badly?

2. Is there not likely to be another swarm sooner where drawn combs are used?

3. My queens are clipped. I move the old hive to a new stand, replace it with another of full sheets of foundation, yet I have had several cases in each of the past three seasons where the bees have reared more cells and in due time swarmed again. I use the 10-frame double-walled hive. (My spring count of colonies for these seasons has not been above fifteen.) Can you suggest a cause for such actions?

4. The above condition applies to natural swarming when I caught them in the act. The same experience has been true with us when brushing, though several times I have had several colonies all go together, leaving a queen and only a few bees on the old stand, this happening once or twice after the swarm had drawn quite a little comb, and the queens laying.

5. If, in transferring from a box-hive the bees are drummed into a box and emptied into a modern hive with some drawn combs, the box-hive turned upside down and a queen excluder put on it, and then the modern hive above that, making sure, of course, the queen is in the top hive, will the bees rob out the lower hive? All entrances to the lower hive would be stopped of course. If done early in the season, perhaps even before fruit-bloom, if some honey was provided in the drawn combs, would this not be a reasonably good way of transferring and getting rid of a sticky mess?

VERMONT.

ANSWERS.—1. Honey will be promptly filled into the cells, perhaps in the center of the brood-chamber, but if it gets in the queen's way it will be emptied out again, and unless she is very old the queen will not be restricted in her laying.

2. If you mean another swarm from the old hive, that will not be affected in the least by the combs or the foundation given to the prime swarm. If you mean a swarm from the swarm (what is called a virgin swarm), likely drawn combs would have some tendency to hasten the swarming; but virgin swarms are so rare as to need little consideration.

3. Let me see whether I get you straight. When the swarm issues, you set the swarm on the old stand and at the same time set the old hive on a new stand some distance away. Afterswarms are likely to follow. Try it this way: Set the swarm on the old stand and the old hive close beside it; then, 7 or 8 days later, move the old hive to a new stand some distance away. See if that doesn't turn the trick. You see, in the last case you move the old hive about the time it is ready to send out the first afterswarm; the hive loses its field force, which joins the swarm, and this so weakens and discourages the mother colony that all thought of further swarming is given up.

4. I'm not sure I understand just what does occur. If you'll try again, giving very full particulars, maybe I can help you out, and maybe I can't.

5. I'm not sure just how the thing would turn out. I should expect that in some cases work would be promptly commenced in the upper hives, and in some cases there would be sulking, but work begun sooner or later. In either case the brood in the old hive would be cared for, until it hatched, and then the honey might be carried up promptly, but oftener rather slowly.

Illinois Association

1. What real benefit would I have in joining our Illinois Beekeepers' Association?
2. What are the annual dues?
3. To whom must I write for membership?

ILLINOIS.

ANSWERS.—1. If you should attend one of the meetings of the Association you would not begrudge several times the cost. The wide-awake discussions bring out points of value that might not otherwise be brought out, and some will value equally the opportunity between sessions to meet old acquaintances and to make new ones, coming in close contact with those who are leaders in our pursuit.

Whether you attend the meetings or not, you

will greatly value the excellent report annually issued to the members, giving full account of proceedings at the meeting, and also a report of the Chicago-Northwestern meeting. It would take too much room to tell of the different things that have been accomplished through associations of beekeepers. No telling what new things may be accomplished through organization which are not likely to be accomplished without it.

2. One dollar.

3. Jas. A. Stone, Farmingdale, Ill., is secretary.

Swarm Control

Please publish in your journal how Dr. Miller checks bees from swarming; by running to comb honey.

NEW YORK.

ANSWERS.—Particulars of all I have done in the way of trying to prevent swarming would more than fill this journal. The gist of it is that when you find queen-cells started you must kill them and make the colony queenless for 10 days. If you cage the queen in the hive for 10 days, the colony may need to be treated again, but if you remove the queen and at the end of 10 days introduce a young laying queen there will be no more swarming that year.

Dadant-Langstroth Hives

1. Will not the queen lay more in the Dadant or Jumbo than in the Langstroth, and more in the Langstroth than in the divisible brood-chamber hive?

2. I see that the Dadants obtained 125,000 pounds of extracted honey from 500 hives and that Atwater, of Idaho, realized 100,000 pounds from 1,000 hives of the Langstroth pattern. If the pasturage in both localities is the same, as no doubt it is, is not this a solid argument in favor of the deep frame for the extracted honey production?

3. Will not the use of frames in a hive help to keep the bees from swarming and also tend to increase the size of the bees?

4. I see that A. C. Miller places the 10-frame hive on the Jumbo for supers. Could this also be done with the Dadant? I am under the impression that the latter is wider, deeper and longer than the Jumbo.

MICHIGAN.

ANSWERS.—1. The larger the hive, the more a queen will lay, so long as the capacity of the hive is less than the capacity of the queen. But when the capacity of the queen is reached, then increasing the size of the hive will not increase the laying of the queen. A queen may lay more in a divisible-chamber hive than in a Dadant if there are enough stories in the former, and if the queen can lay more than the Dadant will hold. A queen will likely lay a little more in a Dadant than in a divisible of exactly the same capacity, but the difference, especially in hot weather, is perhaps less than generally supposed.

2. I am quite inclined to the opinion that the Dadant may be better than the Langstroth, but it is far from being proven by what you say. How do you know the pasturage was the same? How do you know that other conditions and management were the same? To make the argument "solid" you should have a number of each kind of hives, say 50, side by side in the same apiary under the same management.

3. Quite likely swarming will be lessened if nine frames are used in a 10-frame hive and the spacing of the frames from center to center be increased. But it will not increase the size of the bees.

4. A little ingenuity will enable you to add just together two hives of different size by tacking on strips.

Moving Bees

1. I have 20 colonies of bees that I wish to move about 175 miles some time in April or May, through a mountainous country, in a wagon. Roads are fairly good. Please give me some suggestions how to proceed.

2. Do you think a screen would be necessary over the top?

UTAH.

ANSWERS.—1. If your frames are not self-spacing fasten them in some way so they cannot shake, if necessary driving a nail into each end of the end-bars, not driving it so deep but what you can easily draw it out. Put the hives on the wagon with the frames running crosswise.

2. If the entrance is large there may be no need of a screen over the top. But if it be only three-eighths of an inch deep, it will be much better to have the top screened. Of course, much depends on whether the weather is warm or cool. If a day unusually warm should come, and the bees show uneasiness, give them a good sprinkling of cold water.

Shipping Bees

1. I live near Wilmington, N. C. According to "Honey Markets," issued by the government, honey sells for more by the barrel in New York than I can get elsewhere. We have New York steamers on regular runs. I want to sell my honey this way for this season, provided this is the best way. After a year of bitter experience I want to sell on a "sure pay" or "cash with order" basis.

Do you think a New York firm would inspect and pay for honey in Wilmington, N. C.? Can you or anyone else post me a little as to best steps to take? I don't claim to be much up on business details, as I have spent about all of my time "among the bees."

2. Hal! you migratory beekeepers; how about the bee package business? Instead of one man buying and another selling, why not one man or firm start at a southern point and ship his bees to central honey-flows, and then ship again for the flow further north, and then at the end ship far south again? Make nuclei and add shipped bees to them.

NORTH CAROLINA

ANSWERS.—V. In the market quotations in the bee journals are the names of firms that do business in New York and other large markets. Write directly to any of these, and if you have what they want there ought to be no great difficulty in opening negotiations with them.

2. Shipping bees back and forth, as you suggest, has been tried at different times with more or less success, but the success in general has not been sufficient to warrant a continuance for any length of time. The package business is as yet on trial, but at present it looks as if the difficulties are not insurmountable, and that it has a fair prospect of becoming an established business. So there seems little probability of the revival of migratory beekeeping to the detriment of the package business.

Nucleus Without Queen

1. What do you think about using nine frames in standard 10-frame hives to give bees clustering space? Which do you recommend, ten frames or nine?

2. What do you think about taking three frames of brood and bees without a queen to start a new colony? How and when would you do this?

INDIANA.

ANSWERS.—1. Likely you will do better to use the ten frames. Unless you use a dummy with nine, there will be too much space at the side. But it might be a gain to use the nine and increase the spacing.

2. I wouldn't think of starting with 3 broods without giving a queen or a queen-cell. If you give one of these you can start the nucleus about swarming time.

Bees in Packages

1. I am thinking of getting a few hives of bees to get used to handling them. I know but very little about bees. I am figuring on getting a few 2-pound packages with queens. Would it be safe to put them in a new hive with only full sheets of foundation in frames?

2. How late in the season would it be safe for a 2-pound package in a new hive for them to get strong enough for winter?

IOWA.

ANSWERS.—1. Yes; although there is some chance of their swarming out. It will be bet-

ter if you give them a comb with at least a little brood in it.

2. Seasons differ so much that one cannot set a definite date. The first of September might do in some cases, and the first of July might be too late in others. You're not likely to get them any too early.

Swarming

I have 15 colonies of bees. I want to know in the spring, when I cut the queen-cells out of them if I could put all the capped brood up in the super. Would that be a good idea, to keep them from swarming.

CALIFORNIA.

ANSWER.—Yes; when you find queen-cells started for swarming, cut them out, put all but one brood in an upper story above a queen-excluder and leave the queen with the one brood below the excluder. That ought to leave very little chance for swarming.

Old Sections

I left a lot of surplus on my hives last fall, mostly filled with comb partly filled with honey. Would you remove them in the spring and replace with new sections and foundation, or leave them on to be refilled with honey again?

MISSOURI.

ANSWER.—Any honey in the sections is pretty sure to be candied, and a section with candied honey in it is hardly marketable. Take off the sections and sort out those containing honey, giving back the others.

Queen Rearing

1. I have my bees in the cellar; will take out as early as possible and use a wire protector for the entrance, which I will remove whenever it is above 60 degrees, then replace it at noon, or shortly after noon, so that no more bees can get out to get chilled by evening cool air; of course, will have a bee-escape placed in the entrance protector in such a way that all bees that happen to be out can get back in O. K., but those that are tempted to go out when it is too late, can't do it. This will be my way to prevent spring dwindling.

2. I have a very fine Italian golden queen from which I want to raise a few queens. I expect to commence feeding as soon as taken out of cellar to encourage early brood-rearing; then, as soon as she has the chamber pretty well filled, I will take out all but one frame and old queen and put it in a third story, putting empty comb in first and second stories, the third story being so far from the queen they will at once start a lot of queen-cells; then, after about 8 days, as soon as they are sealed, will divide the second story with a tight division-board, third story likewise, and put one or two frames with a good cell on same, in each department; then, after a few days, or nearly time for the new queens to hatch, open entrances out for each division, so the drones can get out, and likewise the queens, to mate. Of course I will have queen-excluders between first and second and second and third brood-chambers. Perhaps the 4 will all mate and return to their divisions; may lose one or two, but in case I do, what is the best method of introducing them into the other hives, by cage, or can I take a frame of brood with queen and adhering bees and after killing the other old queens insert the frame with young queen? Would they accept her this way, say a day or two after the old queen was killed, and they discover that they are queenless? Or would it be best to cage the new queen and introduce as per usual instructions?

OHIO.

ANSWERS.—1. As a special favor to me, I wish you would try your plan on only one colony. Then take the others out of cellar as late as possible, leaving them in cellar as long as they are quiet, say until soft maples are in bloom, and don't do anything to keep them from flying out whenever they feel like it.

2. In your locality there is likely to be something in the way of stores to be gathered as soon as bees can fly freely, in which case feeding will not hurry up brood-rearing, and it may do a lot of harm to feed when bees cannot fly. Neither will you find it a successful thing to try to rear queens much before the natural time when bees begin to rear them for swarming. In trying to have queens reared

and mated above a laying queen, be prepared to have more failures than successes, unless you do better than I have done.

Your plan of introducing a queen on a frame of her own bees is so certain of success that I wouldn't think it worth while to cage the queen. If you should want to cage the queen, I think you will find there is no danger of injuring her.

Care of Supers—Returning Bees

1. When you have taken the honey from the extracting supers in the fall, would you advise the replacing of them on the hives in order that the combs might be cleaned out by the bees, before storing them away for the winter?

2. In your oft-repeated method for the prevention of after-swarming would you kindly point out its after effects upon the parent colony (a) as to bee increase, (b) as to honey production?

3. My winter bee shed is some five rods distant from the summer stands, and when I move out the colonies in the spring many of the bees return to their winter quarters. I believe thousands are lost in this manner. Any helpful suggestions to overcome this serious difficulty will be much appreciated.

4. Have you ever known of a person being rendered unconscious for three or four hours after being stung in the neck about three or four times by bees? I should like to know, as a man here had the experience last summer.

BRITISH COLUMBIA.

ANSWERS.—1. Yes, unless you prefer to set them out in the open. In the latter case the bees are more sure to clean them out promptly and entirely.

2. As there are plenty of young bees to take care of all the brood, there should be no less increase of bees. The mother colony loses its field forces when moved, and will store less honey than if not moved. But the swarm will store more.

3. When you have removed the bees, put in the winter shed a hive containing empty combs, in which any returning bees will gather. At evening brush these in front of any hive or hives you like, and return the combs to the shed. You may have to repeat this for several days.

4. I have never known such a case personally, but have read of something of the kind. I think such cases are rare.

Rearing Queens

1. I wish to raise a few queens, and on reading "Practical Queen Rearing" by F. C. Pellett thought for my purpose and for the present would use the Miller plan; but it says it (the comb) will contain young brood with an outer margin of eggs. Now, I would suppose that outer margin of eggs would be just what the bees need to start feeding for the queens, since the younger the larva the better, but instruction says, trim away with a sharp knife all the outer margin of combs which contain eggs, except perhaps a very few next to the youngest brood. For what reason are the eggs all cut out, or perhaps only a very few left?

2. Is it a sure thing to put this comb for queen-cells in upper story with excluder between it and brood-chamber; where would you put it?

3. In using an excluder for the above purpose, is there any difference (as some claim) between a zinc and wire excluder?

4. Another thing puzzles me. In Doolittle's management of outapiaries he uses Dr. Miller's bottom-board, using the shallow depth (three-eighths deep) for summer and 2 in. depth for winter. In other words, he gives more ventilation in winter than in summer; why?

5. In Alexander's writings on Practical Bee Culture he is asked, what becomes of the drones that are in upper story when excluder is between (them) upper and lower stories? Why could not drones live in upper story as well as young bees, or must bees have egress and ingress every few days? The queen doesn't fly out every few days.

6. I will be thankful if you will state your method of having the queen-cells drawn out; your method is not stated in F. C. Pellett's book, but possibly you use one of the methods mentioned. If placing in upper story would do, with excluder, that would be the simplest plan.

FLORIDA.

ANSWERS.—1. The bees choose for queen-cells larva, not eggs, and that margin of eggs is only in the way. It is possible that later, after the eggs have hatched out into larva, the bees might use them for queen-cells, but that is not desirable. Another thing is that bees show a decided preference for rearing cells on the margin of a comb, and trimming away the eggs gives them the youngest larva on such a margin. But there's no law against your leaving the margin untrimmed, if you prefer.

2. No, I would never have queen-cells started over an excluder with a laying queen below. It's not a dead sure thing that any will be started, and if any are started the number is likely to be small. To start the cells I remove the queen from a strong colony, and about a day later put the prepared comb in the center of the hive. The comb is so much to the taste of the bees that they are not likely to start cells on the other combs, and if they do you need not use them.

3. The bees are more likely to start cells over the zinc excluder, because it shuts off communication more fully. But if you lay any kind of a cloth over the wire excluder, still leaving an inch or more at the sides for passage, you will succeed better than with the zinc in getting cells started, or continued after they are started.

4. A deep space under bottom-bars is desirable summer and winter; but in summer the bees will build comb in the deep space, so I invented the Miller reversible bottom-board. But I have not used it for many years, using the 2-inch space summer and winter, and keeping the bees from building down in summer by the use of a bottom-rack, as you will find in "Fifty Years Among the Bees."

5. I don't know enough to tell all about it; but I suppose the queen is built to stand the confinement and drones and workers are not.

6. I think this question is answered in previous answers, and you will find the whole plan very fully given in "Fifty Years Among the Bees."

Building Up in Spring

I have bees in movable frame (old style) hives. Would you please advise me of the best way to build up this spring in two hives, that is, have a double brood-nest, and have it with the maximum of bees at the beginning of alsike clover? There are thirty-two acres adjacent to my bees. It begins to bloom about the last of June here. Could I split these large brood-nests at finish of clover, supplying extra hive-body to each half and have them build up strong for the fall flow?

LOUISIANA.

ANSWER.—If you should be so fortunate as to have all strong colonies in spring, there is nothing better than to let them do their own building up. If some of them are weak, you can do a good deal toward helping. Briefly, my plan is something like this: From the strong colonies draw frames of brood with adhering bees, but never leaving in any hive less than four frames of brood. Give these frames of brood and bees to colonies which have less than four frames of brood, giving first not to the weakest but to the strongest of those needing help, leaving the weakest to be helped later on.

A very strong colony divided at the finish of clover flow should build up and store in fall flow. Like enough you might get more honey not to divide; but then you would have the increase.

Spring Feeding

1. I have eight colonies of bees in 10-frame hives, packed in dry goods boxes for winter. Would I be able to secure a larger crop by feeding sugar in the spring and increasing by the Alexander plan, or holding them at eight colonies?

2. In your book "Fifty Years Among the Bees" you say you don't know whether you have the wisdom to feed properly or not.

What do you mean by that? What are the dangers of spring feeding?

ILLINOIS.

ANSWERS.—1. In your locality you will probably get a larger crop by holding them at eight colonies. If your main yield were in the fall might be otherwise.

2. If you feed on a raw day it may start the bees to flying out, and so many of them may be chilled and lost that more harm than good will follow. Just exactly when it will do more harm than good is a thing I haven't the wisdom always to tell. If the bees haven't a fair store of honey in the hive, then it is imperative to feed. But the idea that feeding will always increase brood-rearing is a delusion. In my locality—and also in yours—I very much doubt if there is ever a time in the spring when feeding will increase brood-rearing if the bees have already abundant stores in the hive. There are localities where early in the season there is an utter lack of stores continued for so long a time that the queen stops laying. In such case feeding is exceedingly advantageous. But in your locality there is never any very long time when at least a little cannot be had from the fields. If your bees are worth keeping you will find that in spring they have all the brood they can cover; then how can feeding help? Unless, indeed, they are short of stores, and then you must feed.

To Prevent Swarming

1. After using the "putup" plan, is it necessary to make any further effort to destroy queen-cells? About what time in the season do you cease destroying the queen-cells to prevent swarming?

2. If you were using 10-frame hives would you double the brood-chambers as with the 8-frame and then reduce before putting on the supers at the beginning of the clover flow?

3. In using 10-frame hives what objection would there be to omitting one frame to make the manipulation more easy?

INDIANA.

ANSWERS.—1. If the old queen is returned to the hive, there is always a possibility that cells may be started later on. Incidentally I may say that it is not a very uncommon thing for cells to be started immediately on the return of the queen, only to be destroyed by the bees before maturity. There is no fixed date when one can say there is no further need to look for cells. But when the flow begins to wane, or when but few cells are found in any one hive, one is pretty safe in saying that the cells are started for superseding rather than for swarming. In any case, if a young queen of the current season's rearing is given in place of the old queen, no further search is made for cells in that colony.

2. Yes, if needed; but fewer second stories would be needed with the larger hives. For, after all colonies were equalized, not so many of them would be strong enough to need a second story.

3. The objection would be that there would be fewer cells for the queen to use. To offset this would be the advantage that the use of a dummy would make it easier to take out frames. Also, that it would give opportunity to space the frames $1\frac{1}{2}$ inches from center, which some good authorities think would lessen swarming.

Foulbrood

1. Would it be safe to use the brood-frames after melting American foulbrood out of them?

2. If so, what kind of treatment shall I give them?

3. Would it be necessary to treat the hive-bodies?

4. Would it be safe to use foundation after being in a hive that had American foulbrood in, but have not drawn them out? Please answer in the March number if you can.

INDIANA.

ANSWERS.—1 and 2. If, in melting out the

combs, the frames were kept at the boiling point for half an hour, it might be safe to use them again without further treatment; although it might be safer still if the frames were baked in an oven afterward, being heated as high as they would stand without charring the wood.

3. Many good authorities think it unnecessary.

4. It would likely be safe.

Let me add a word. If I had the disease in my own apiary I wouldn't hesitate to use all the things mentioned, only it would be a question whether it might not be cheaper to use new frames than to clean up the old ones. But if the disease were not in my apiary, and never had been, I would promptly decline the frames as a gift, and would hesitate about accepting the other things.

What Kind of Queens?

1. Do you think it would pay to buy an Italian queen for one swarm of bees?

2. Would a queen costing \$1 to \$1.25 be all right?

3. Would you buy a tested or untested queen?

4. What kind would you buy, three-banded golden, or leather colored?

5. Is Madison county counted a good locality for bees?

6. When would be the best time for the queen to come?

IOWA.

ANSWERS.—1. Most likely. In many cases the difference in one crop of honey would more than pay for the queen, and you would have the advantage continued in future crops. But a queen you buy this year will make more difference in the crop next year than this.

2. Yes; thousands of good queens are sold at those prices.

3. Hard to say. Like enough the untested will turn out as good as the tested; but the tested ought to be a little surer to be good.

4. You'll be pretty safe on a three-banded, leather-colored.

5. I don't know, but I suppose it is. (Some parts very good.—F. C. P.)

6. June is a good time.

Ants—Roaches

Do roaches do any particular damage to a colony of bees? What is a good method of preventing damage by roaches in a hive of bees?

What is the best method of preventing ants from annoying bees?

ALABAMA.

ANSWER.—In the North neither ants nor cockroaches do any harm, probably, beyond annoying the bees by their presence, and their presence in the hive can be prevented simply by having no place in the hive that an ant can enter and a bee cannot. Quilts or sheets that allow ants to make their nests where the bees cannot get at them are, consequently, not so good as having covers with a bee-space between top-bars and covers; for if the bees can get into every place where the ants can, the bees can hold their own against the ants. In the South, however, there are ants that may destroy whole colonies of bees. These may be traced to their nests and destroyed by kerosene or carbon disulfide, and the hives may be set on posts with cups containing coal-tar, creosote or petroleum.

Cross Bees

I have 5 colonies of Italian bees. I bought one hive three years ago and got the rest from swarms. These bees are very cross. They are at least 500 feet from the house; had to put them there, as I used to have them 100 feet from the house, just to get acquainted with us, but had to move them, being stung so often; and now, while working in 300 feet of the hives in the field they are very bothersome, and while working on the hives they get very bad. I used to have bees for years on a city lot 25x100 feet, which never made any trouble for me or neighbors. Would you advise me to requeen the 5 colonies with a good strain of Italians this spring, or is there any other reason these bees are so cross?

NEW JERSEY.

ANSWER.—There is nothing better than to requeen with a better-natured strain. But are you sure that all five colonies are equally guilty? It sometimes happens that a single colony is very cross, and unless very close observation is made it will seem that all the bees in the apiary are on the war-path. One way to do is to walk quietly in front of the hives and see whether the bees from a single colony dart out at you, or whether all do it. It is possible, however, that by introducing a good Italian queen into each colony you would gain enough in the harvest to pay more than the cost of making the change.

Smoker—Disease

1. Which is the proper place to put the grate in a smoker? Some say in the bottom and some on top of the fuel.

2. Is the Tri-State hive as good as the dove-tailed?

3. Will you please give the pronunciation of the name "Dadant?" Every beekeeper around here has his own way to pronounce it.

4. Last year there was a disease in the brood of three of my hives. As near as I could tell it was European foulbrood. I wrote Mr. Kil-dow about it and he said he would send me his Bulletin. I never received it. By that time I noticed it was clearing up a little. They were all right when winter set in. Now what I want to know is will the disease appear in the spring?

5. Was there any nectar in Spanish needle last fall? I never got a drop of honey from it nor white clover either. The honey I got came from catnip and horehound.

ILLINOIS.

ANSWERS.—1. Most smokers are made so that the grate is put in the bottom and the fuel on top of it.

2. It is much the same.

3. The Dadants came from France, and if you heard the name pronounced as it is in French I don't suppose you could repeat it to save your neck. But the whole bunch of Dadants are very much American—100 per cent—and so the name has been Americanized and is pronounced Day-dant, accent on both syllables.

4. It may. If it does, send to Dr. E. F. Phillips, U. S. Department of Agriculture, Washington, D. C., and he will send you a box in which you can send him a sample, and then he will tell you what the trouble is with printed information about it. This will cost you nothing.

5. I cannot tell you.

Bees on Shares

I am working 300 stands of bees, one-half started in 1918, for two years, each to get half of the proceeds and each to pay half of the expenses. I am to do all the work. When I took the bees we were running for comb honey. This year he has decided to run half for extracting. There is nothing said in the contract about changing. Now is it up to me to do all this work and stand half of the foundation, or is it the owner's place to do that? Hoping this won't be asking too much of you.

CALIFORNIA.

ANSWER.—Working on shares is a more or less complicated thing, about which I know none too much, so I hardly dare hazard an opinion. Of course, if the change is such as to make it less profitable to you, then there should be some change in the agreement to correspond. But "in this locality" it is considered that it takes less work to produce extracted than section honey. And if you use full sheets of foundation in sections it ought to take less foundation for extracted honey. But there may be something in the case I don't understand.

Spinning Honey

Is there any method by which honey can be spun, and if so, after the process, what color does it assume, and is this peculiar color due to adulteration or simply to the process it has undergone. I have just been told that they have a process of spinning honey in the south and that after the process the honey becomes white and takes on a pliability equal

to that of lard. Is this true, or have I been misinformed?
MICHIGAN.

ANSWER.—Spinning honey is something I never heard of before, and I must confess ignorance. If extracted honey is stirred occasionally as it begins to candy it helps to make it smooth and fine-grained, and what you say at the last may refer to this.

Granulation of Honey—Decoy Hives

1. I had some extracted honey last fall which I took from the bees in August, and after the weather turned cold it turned to sugar. It was pure honey; no water mixed with it, and it remained sweet. After allowing it to stand in warm water it would receive its natural color and form again. What caused it to turn to sugar? Do you suppose the honey the bees have stored in the brood-frames for winter use has turned to sugar? If so, what effect would it have on the bees?

2. The moths got after my comb honey last fall. They started their destructive work at the bottom of the sections, working upward. What is the best way of storing comb honey to keep the moths out of it?

3. One of my prime swarms that I had last summer came out in the morning and settled on a bush. It did not remain very long, and it went back into the hive. So I thought it would perhaps come out in the afternoon again. So I took a hive with full sheets of foundation in the frames and set it on a step-ladder near the place where the swarm had settled in the morning. In the afternoon the swarm came out again and settled on the cover of the hive which I had on the step-ladder and then crawled into the hive. This gave me an idea of putting empty boxes with an entrance into them and a removable bottom and set them on posts and in trees and try my luck on having swarms go into them. How do you think it will work?
ILLINOIS.

ANSWERS.—1. Oh, no; your honey didn't turn to sugar; it was honey still, granulated or candied honey. Under ordinary circumstances you will find your extracted honey will always granulate in the course of a few months, following a law of nature. What the bees have stored in their brood-combs usually does not granulate, and if a little of it does granulate no great harm comes from it.

2. It is easy to store section honey away from moths. Just store it in any room or box with no crack big enough for moths to crawl through. For all that you may find your sections becoming "wormy," for the moths lay eggs in the sections before the sections are taken from the hive. The most important thing to prevent this is to have Italian bees.

(To kill the moths, burn brimstone under the crates of honey a few days after they have been taken from the bees.—Editor.)

3. It will work in a good many cases.

Bees Dying in Winter

I have lost four colonies so far this winter from no cause that I am able to figure out. They are being wintered outside; hives are banked up and covered with hay, front entrances open. They stood the extreme cold weather of January O. K., and since then the temperature has not been below 20 above zero. The hives are full of honey and when I opened them to look them over I found all the bees dead in clusters. The weather has been unusually warm for this time of season.

Can you tell me, through the columns of the American Bee Journal what is causing them to die, so I can save the balance? There are no moths or foulbrood.
IOWA.

ANSWER.—I don't know, and I can't even make any decent guess what the trouble is. If it were in a very cold locality it might be that the bees were stranded on one side of the hive, all stores within reach consumed, and too cold for the bees to reach the stores in the other combs; but from what is said it cannot be cold enough for that. As a forlorn hope, one might guess poison or poisonous stores, in which case matters might be improved to take away the stores and give sugar syrup. But somehow it doesn't look like poison. Queenlessness and death from old age might be suggested, but that would hardly be so much by wholesale.

(We are all puzzled to know what is the matter. Can any reader explain the trouble?—Editor.)

Queens at Swarming Time

When a swarm comes out with the old queen and is put in a hive and when the same hive casts the second swarm, can I take out the old queen and put in the young queen with the first swarm without introduction?
NEW YORK.

ANSWER.—You might do so; but you can go about to have the two swarms together and have the young queen in a different way that you might like better. When the prime swarm issues, take away the old queen and return the swarm. Then a week or so later the young queen will issue with a swarm, which you can set on the old stand and move the old hive to a new stand, and then there will be no more swarming.

C. A. Taylor, in a few pointed introductory remarks expressed his desire to aid the beekeepers in every way possible to solve their problems.

Geo. H. Rea, of the United States Bureau of Entomology, spoke on the advantages of organization for the beekeepers. Beekeepers need county associations for the purpose of the control of bee diseases, the co-operative purchase of bee supplies and the sale of bee products. The educational and social side of such meetings should be emphasized, also. After the beekeepers had discussed their problems, such as wintering and bee diseases, they organized the Herkimer County Beekeepers' Association, and the following persons were elected to office:

President—Lewis J. Elwood, Fort Plain, N. Y.

Vice President—Geo. P. Walrath, Ilion, N. Y.

Secretary-Treasurer—C. Gardner, Herkimer, N. Y.

A campaign for membership will be carried on immediately, with the hope that every beekeeper in the county will avail himself of the opportunity to join. The following membership committee was appointed to take charge of the work: Oscar Bronner, Mohawk, N. Y.; Clyde Ransom, Little Falls, N. Y., and George P. Walrath, Ilion, N. Y.

Extension Work on the Pacific Coast

The extension work in beekeeping is rapidly coming to cover all sections of our country. In the northwest, Ward H. Foster and H. A. Schullen are doing some effective work. In these States little has been done along these lines until recently, and these men should find a fertile field for effort.

Another Texas County Organized

The Dallas County, Texas, beekeepers have recently organized, with W. E. Joor, President; John R. Hancock, Vice President, and Wm. L. Peacock, Secretary-Treasurer. With so many county organizations co-operating with the State Entomologist, the Texas beekeepers should do some effective work.

Three-Day Bee Schools in Wisconsin

Wisconsin has long been in the forefront of the beekeeping States, since it was the first to provide statewide bee inspection. The State University is undertaking some extended work in beekeeping under direction of Prof. H. F. Wilson. Two 3-day bee schools have been held, one in December and the second in February and March.

Good Short Course

From January 14 to 24 was held the annual winter course in apiculture at the Ontario Agricultural College, Guelph. The 47 men and women students represented three-fourths of the counties of the Province. The enthusiasm shown argues well for the future of the honey industry of Ontario. The course was in charge of Doctor Burton N. Gates, formerly of the Massachusetts Agricultural College, who is now Provincial Api-



Death of Louis Werner

We regret to announce the death of a beekeeper who was a familiar figure at the Illinois and Chicago meetings, Mr. Louis Werner, of Wood River, Ill. Mr. Werner had many mishaps. He suffered for years from rheumatism. On August 21, 1915, his home and apiary were invaded by a flood and he lost his honey crop and the greater part of his 75 colonies. This was mentioned in the American Bee Journal for November, 1915.

Mr. Werner was 65 years old and leaves a wife, four sons and two daughters. He died February 12. The sympathy of the Bee Journal family is extended to them.

Introducing Virgins

In the last issue of the American Bee Journal you say that the intro-

duction of virgins has always been a difficult matter to you. Please try this plan: If you remove the laying queen from the mating nucleus, say in the afternoon on Monday, go to the nucleus again on Friday afternoon, destroy the cells, a half hour later push the cover of the nucleus hive a little to the front and let the virgin run in. I have introduced hundreds in this way and don't remember of one failure. The point which must be observed is that the bees receiving the virgin must be at least 4 days queenless. I generally give the virgins when they are less than 24 hours old.

F. W. LUEBECK,
Knox, Ind.

Herkimer County Organizes

The beekeepers of Herkimer County, N. Y., gathered in the Farm Bureau office January 28. County Agent

arist for Ontario. He was assisted by Mr. W. A. Weir, Mr. Jas. Armstrong and Mr. F. W. L. Sladen, Dominion Apiarist, as well as by the various members of the college staff in the several departments. This was one of the largest short courses in beekeeping ever held at the institution.
GORDON DIXON, Toronto, Ont.

Tennessee and West Virginia

I had occasion to visit friends in Kentucky in January and took advantage of the opportunity to attend both the Tennessee meeting at Nashville and that of West Virginia at Charleston.

About 50 Tennessee beekeepers attended the Nashville meeting and among them one of the old war horses of beekeeping, John M. Davis, who has been known to readers of the American Bee Journal for over 45 years. I also met one of the winning lady writers on bees, Mrs. Grace Allen, of Nashville, who read a very interesting paper. Mr. G. M. Bentley, the secretary of the State organizations of Fruit Growers, Florists, Nurserymen and Beekeepers, is a live wire and turned out to be a practical apiarist, in spite of his cumulative office. Dr. J. S. Ward, the State Inspector, was abed with the influenza, but he was ably represented by his brother, Porter Ward, who was elected president.

Among those from the North, I met J. C. Allen, of Wisconsin. The Tennessee beekeepers have a growing and interesting association.

At Charleston the meeting was presided over by T. K. Massie, an old, experienced apiarist. Mr. Chas. A. Reese, the State Apiarist, exhibited some moving pictures of apiary work. The State of West Virginia appropriated \$10,000 last year to promote apiary work. It was needed, for I was told that the majority of bee owners are still "bee-gum" apiarists. The gum tree, which is usually hollow, is cut down and sawed

into lengths of 3 or 4 feet, with a board at each end and a few notches for entrances.

The few beekeepers who met at this convention are all practical men. Messrs. Luzader and Griffith, who live in the north Pan Handle country, gave timely descriptions of the resources of their section. Mr. Griffith is full of jokes and can keep a meeting in a roar of laughter.

For the first time I met a deaf-and-dumb apiarist, Mr. L. O. Simmons, who had a very interesting paper read by the secretary. Here, also, I heard of war cripples taking up beekeeping, and on my way home met a young soldier who lost an arm at Chateau-Thierry and wants to try beekeeping.

West Virginia, from all reports, does not have very special honey-flows. But there are lots of fruit trees, much sumach, some white clover and fall blossoms. The honey I saw was nearly all amber of good flavor.

On the whole, West Virginia appears to have a bright future for honey production, if its Legislature continues to sustain an effort to draw the mountaineer out of the rut of log-gum beekeeping. The gums should disappear with the moonshine and give room for more modern methods.

The writer was elected an honorary member of both associations, an honor much appreciated.—C. P. Dadant.

Are Queens Reared from Grafted Larvæ Short-Lived?

After closely noting the careers of queens raised on the transference of larvæ to artificial cell cups and those raised in cells built over eggs without removal, I am strongly in favor of the latter. I have found those raised by the former method, as a rule, short-lived and inferior all around to those raised by the latter one. I have no hesitation to attribute our

repeated failures to get queens through alive from America during the past fifteen years to that method. In former years, before transferring came into vogue, I could always depend upon getting 50 per cent in good condition, and often all of them.

ISAAC HOPKINS,
Epsom, Auckland, N. Z.

Getting Rid of Ants

Beekeepers who are troubled with ordinary ants about the beehive will do well to prepare a strong solution of borax or boracic acid and water, to be mixed with some sweet, such as syrup or honey.

This, if used where the ants are found, will soon poison all of them. Care must be taken, however to put the poison in a receptacle so that the bees cannot avail themselves of it, or they too will suffer.

HENRY BEST,
Hibbetts, Ohio.

More Farm Manuals

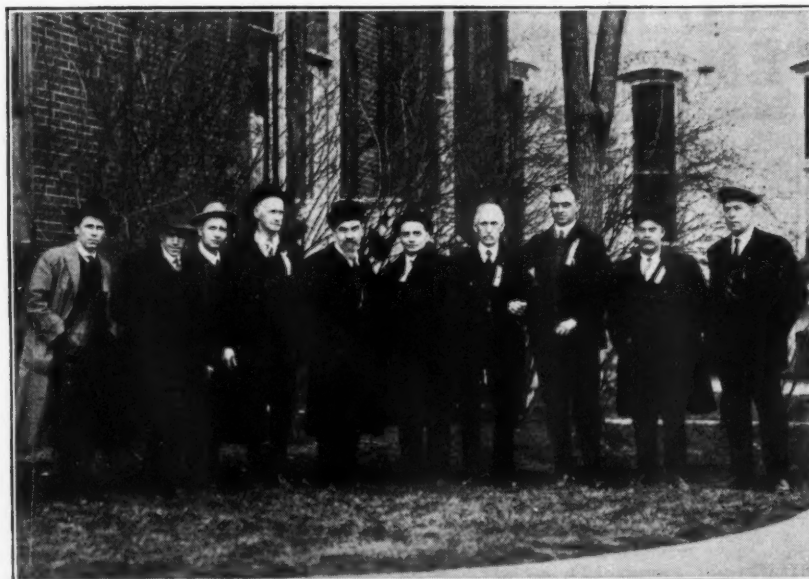
The Lippincott series of Farm Manuals, which has been mentioned in our pages before, now numbers 12 volumes. Each volume is written by a recognized authority and the series, as a whole, forms a valuable library of agricultural information. Productive Beekeeping, by our associate editor is one of this series.

Productive Sheep Husbandry, by Prof. Walter C. Coffee, of the University of Illinois, is another valuable volume. There is no more profitable adjunct to the farm than a flock of sheep. This volume opens with an interesting account of the development of the sheep industry since early times. It also contains an extended account of the characteristics of the various breeds, the diseases to which they are subject, methods of profitable management, production of wool, feeding for market, etc. In all it contains 479 pages of indispensable information for the sheep owner.

Injurious Insects and Useful Birds is by F. L. Washburn, also of the University of Minnesota, and for many years State Entomologist. It contains several colored plates showing well-known insects and birds which add much to the volume. Most of the common insects which injure farm and garden crops are described, and may be recognized from the pictures. There are more than 400 illustrations, nearly as many as there are pages in the book.

A work of this kind is useful to every owner of a garden or larger area of cultivated land. Insects are apparently becoming more destructive as the country grows older, and a knowledge of their life history and habits will often save the owner many times the cost of such a book.

These books are all published by the J. B. Lippincott Company, of Philadelphia. The price of the Dairy and Sheep books are \$1.75 each, and of the Bird and Insect book, \$2. They can be had from the publishers, or from this office, for the prices named.



Group of West Virginia beekeepers—Left to right: Kelley Lance, Homer Mathewson, Will C. Griffith, T. K. Massie, C. P. Dadant, O. D. Lanham, P. L. Jones, L. O. Simmons, R. L. Richardson, Grant Luzader.



Group of Beekeepers at the Ithaca, New York Short Course

Death of Mr. John Thornton

We have word of the death of Mr. John Thornton, of Lima, Ill., a well-known beekeeper and fruit grower of that district. Mr. Thornton was only 58 years old at the time of his death.

A Series of Short Courses for April

A letter from Doctor Phillips conveys the information that a series of short courses for commercial beekeepers, similar to those held in California and New York, are planned for mid-western States during the month of April. The first is to be held at Purdue University, Lafayette, Ind., from April 7 to 12. The second will be held at Ames, Iowa, at the State College of Agriculture, from April 14 to 19, and the week following at University Farm, St. Paul, Minn., from April 21 to 26, a similar course will be held. The program will be similar to that followed at the California and New York courses, with Doctor Phillips and Mr. Demuth, from the U. S. Department, co-operating with officials of the various universities. Mr. Dadant, from this office, expects to attend the Indiana short course, while Mr. Pellett expects to be present at Iowa.

The Nebraska Convention

The Nebraska beekeepers met at Lincoln this year in connection with the "Organized Agriculture" meetings at the Agricultural College. The sessions were well attended and the interest very good. Prof. F. E. Millen, Iowa State Apiarist; E. G. Brown, of the Western Honey Producers', and Frank C. Pellett, of our staff, were the speakers from outside the State. H. C. Cook, of Omaha, conducted the question box. Mr. Cook is one of the best known Nebraska beekeepers and has been active in support of a bill which has been introduced in the legislature to provide a State Apiarist, similar to the Iowa officer, who shall be responsible for inspection and for educational work in beekeeping as well. The bill is reported to have failed at this session, but will probably be brought up again later, as the association is anxious to have

the beekeeping work firmly established at the university.

The retiring officers are to be congratulated on the success of the first year of the new organization. Mr. Harris, the president; Mr. Olsen, vice president, and Mr. Timm, the secretary, have all been active in the new organization and have reason to be gratified with the success of the first convention. The secretary explained that he would be unable to devote as much time to the work during the coming season as has been required of him, and asked to be relieved.

Rev. R. W. Livers, of Hardy, was elected president and Prof. Myron H. Swenk, of the University, secretary. Prof. Swenk is teaching a course in beekeeping at the college and is much pleased with the interest manifested. We feel sure that Prof. Swenk will extend the work just as rapidly as circumstances will permit. A series of field meetings, to be under the joint supervision of the University and the Association, are planned for the coming summer. These will be held at different points within the State so as to be within reach of as many beekeepers as possible.

Death of Oscar Dines

We have only lately been apprised of the sudden death in the last days of December, of Oscar Dines, one of the most practical beekeepers of New York State. Mr. Dines kept nearly 300 colonies of bees in one apiary and was one of the happiest beemen we ever knew. He enjoyed nothing better than being among his bees. He died suddenly.

An Experimental Apiary for Texas

We see by the "Beekeepers Item" that a bill is now pending in Texas which provides for the establishment of experimental apiaries. This is a much to be desired end, and we hope to hear that the bill has been passed and a sufficient appropriation provided. There is much yet to be learned about bees, and many problems can only be worked out properly by State experimental stations, since the individual cannot afford the

expenditure necessary to make the exhaustive tests to determine many interesting points.

Enlarging the Small Hive

When I began beekeeping three years ago my bees were in the 8-frame Langstroth hives. I soon got the tip that my hives were too small for the queens which were in them. I lifted the brood-chamber from the bottom-board and put a shallow extracting super underneath. I find this works fine; the queens filled all the frames in both compartments with brood. I find that putting the half-story under the brood-chamber is better than to put it on top. I have no trouble with queens going into the supers. The bees winter well in these one and a half story hives, outside.

E. E. EVITT, Paris, Ill.

Paste for Tin

I note on page 62 of the February Journal an enquiry for a paste to stick labels on tin. I have had difficulty with this problem and have tried honey in the paste, with indifferent success. It seems to help on some grades of tin, but is unreliable. The difficulty seems to be in a coating on the tin rather than in the paste, and if the tin is wiped with a cloth wet with muriatic acid it will clean the tin so that ordinary paste will hold.

A. GORDON DYE,
Rochester, N. Y.

UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Markets Shipping Point Information

San Francisco: Supplies liberal. Practically no demand or movement, buyers holding off. Cash to producers at country loading points: Extracted: per pound, water white, 18-19c, sage white 18c, light amber 17c, dark amber 14-16c. Beeswax, 36-38c. per pound.

Los Angeles: Cool, cloudy. No demand, practically no movement, no sales reported. Only few cars still in state. Beeswax: few sales. Cash to producer on farm, 38c per pound.

Chicago: No carlot arrivals. Supplies liberal. Demand light, movement limited, prices unsettled. Sales to jobbers, all sections: Extracted, per pound, white 20-24c, amber 18-26c. Comb: 24-section cases, No. 1 mostly \$6.50 per case. Beeswax: Refined 45-50c, unrefined, mostly 42c per pound.

Cincinnati: 1 California extracted arrived, no carlot arrivals of comb, nearby receipts very light. Supplies liberal. Practically no demand, no sales reported. Beeswax: Demand and movement moderate. Average yellow 40c per pound.

Cleveland: Thursday, Feb. 13—Demand slow, prices lower. Sales to bakers and confectioners: Westerns 60-lb. tins sweet clover and orange blossom, 22-26c per pound.

Denver: Approximately 4,000 lbs. extracted arrived. Receipts light. Demand and movement slow. Sales to jobbers: Extracted: white 20-22½c per pound. Beeswax: cash to producer, 38c per pound.

Kansas City: 1 Colorado and approximately 60 cases by freight arrived, 1 broken car on track. Demand and movement moderate. Sales to jobbers, Comb: Missouri, 24-section flat cases No. 1, \$7.50-8.00. Colorado No. 1, \$7.50. Beeswax: 35 -40c per pound.

Minneapolis: Home-grown receipts light. Supplies moderate. Demand and movement slow, little change in prices. Sales direct to retailer, Comb: 24-section cases, Minnesota, quality and condition fair, dark color, \$6-7. Colorado, fancy white, quality good, condition generally good, mostly \$7.50. Extracted: Western, quality and condition generally good, 60-lb. cans, mostly 25c per pound.

New York: Arrivals: 100 barrels Mexico, 2,156 barrels West India. Exported: 2,245 cases, 127 barrels to England, 1,214 cases to Sweden. Demand and movement very slow, very few sales. Sales to jobbers, Extracted: Porto Rican, \$2.20-2.30 per gallon; a few sales at \$2.40. New York State, buckwheat, 18-21c per pound. Beeswax: 442 bags, 90 boxes West Indies arrived. Demand and movement moderate. Light, 42-43c; dark, 40-42c per pound.

Philadelphia: 1 Wyoming extracted arrived. Demand very slow, weak feeling. No sales reported.

Spokane: No rail arrivals. Supplies not cleared up. Demand and movement moderate. Quality and condition good. Sales direct to retailers. Strained: Idaho, water white in tins, 20-23c per pound.

St. Louis: Supplies light. Demand and movement slow. Sales to jobbers: Extracted: Southern, light amber, per pound, in barrels 19-20c, in cans 21-22c. Comb: Practically no supplies on market. Beeswax: Prime, few sales, 35c per pound.

St. Paul: Supplies liberal. Demand and movement slow. Sales direct to retailers, Colorados, quality and condition good, fancy white, 24-section cases, mostly \$7.50. Extracted: Western, quality and condition generally good, mostly 25c per pound.

Export Distribution of Honey (Compiled from data supplied by the Bureau of Foreign and Domestic Commerce.)

Country to which exported	Jan. 1-10, 1919
Total	37,218 lbs.
Including Canada and New Foundland	34,074 lbs.
China	600 lbs.
Corresponding 10-day period	
1918	560,808 lbs.
January	Total since
10-20, 1919	July 1, 1918
Total	87,860 lbs. 4,208,668 lbs.
Including Canada and New Foundland	83,887 lbs. 694,622 lbs.
United Kingdom	2,986,831 lbs.
France	492,301 lbs.
Norway	1,920 lbs. 1,920 lbs.
China	1,148 lbs. 6,375 lbs.
Corresponding 10-day period	
1918	873,597 lbs.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEEES AND QUEENS

QUEENS—Bees by the pound, 3-banded and golden. They are hustlers, gentle to handle, cap their honey white, are very resistant to European foulbrood. Booking orders now one-fourth down, balance at shipping time. See January "ad" for prices on bees by the pound. Quote nuclei f. o. b. here, 2-frame nuclei, \$4.50; 3-frame nuclei, \$6; 1-frame nuclei with 1 lb. extra bees, \$4.50; 1-frame nuclei with 2 lbs. extra bees, \$6; 2-frame nuclei with 1 lb. extra bees, \$6. No discount on nuclei. Select untested queens, \$1.50 each; 25 or more, \$1.35 each. Tested queens, \$2.50. Select tested, \$3. Free circular giving details. Nueces County Apiaries, Calallen Texas. E. B. Ault, Prop.

FOR SALE—Goldens and 3-bands, as good as the best. I have a limited number of tested queens for early shipping at \$2 each. Untested, after May 1, \$1 each. Safe delivery guaranteed if not more than 5 days in transit. No bees for sale. H. P. Gannaway, R. 1, Box 208, Fort Smith, Ark.

FOR SALE—For spring delivery—Colonies of Italian bees fine strain, with tested queen, in 1-story 8-frame single-wall hives, full depth, self-spaced, Hoffman frames, nearly all wired, \$10 each. A few colonies in 10-frame hives, \$11 each; all free from disease; f. o. b. here. Wilmer Clarke, Earlville, Mad. Co., N. Y.

FOR SALE—Mott's Northern Bred Italian queens, untested, \$1 each; 6, \$5.50; 12, \$10. List free. Plans "How to Introduce Queens, and Increase" 25c. Also Golden Campine eggs; best laying bird out. E. E. Mott, Glenwood, Mich.

THREE-BANDED ITALIANS ONLY—Untested queens, 1, \$1.25; 6, \$6.50; 12, \$11.50; 50, \$40; 100, \$75. H. G. Dunn, The Willows, San Jose, Calif.

GOLDENS that are true to name. Untested queens, 1, \$1.25; 6, \$6.50; 12, \$11.50; 50, \$40; 100, \$75. Garden City Apiaries, San Jose, Calif.

FOR SALE—Bright Italian queens, \$1 each; \$10 per doz. Ready April 1. Safe arrival guaranteed. T. J. Talley, R. 4, Greenville, Ala.

BEEES AND QUEENS—When you can't get them from others you can from us. 1 lb. package, \$2; 2-lb. package, \$3.75. Queens, \$1 each, \$11 per doz. Good stock; no disease; order quick. Pelican Apiary, P. O. Box 108, New Orleans, La.

FOR SALE—Two-pound packages of bees for April and May delivery. E. Eggeman, Allenville, Ala.

SAVE THAT QUEENLESS COLONY—Introduce a vigorous tested queen. We can supply them by return mail, \$1.50 each. Three-banded Italians only. Queens are healthy and prolific, reared last fall and wintered in four-frame nuclei; no disease. J. W. K. Shaw & Co., Loreauville, La.

Head your colonies with Simmons' Famous Italian Queens. They took first premium at New York State Fair last September. Goldens or three-bands: 1, \$1.50; 6, \$7.50; 25, \$30. Orders booked now and filled in rotation. Also nucleus from same stock ready for June delivery. Allen R. Simmons, Fairmount Apiary, Claverack, N. Y.

J. B. BROCKWELL'S Golden Queens, untested, May, June and July, \$2 each; six, \$7.50; doz., \$14; tested, \$4 each. Breeders, \$5 to \$20 each; 3-f. nuclei with tested queen, \$9. Barnett, Va.

GOLDENS—When you get tired being stung try one of these; tested, \$2; untested, \$1. Honeysuckle Apiaries, R. F. D. 1 Box 208, Fort Smith, Ark.

GOLDEN ITALIAN QUEENS—No better honey gatherers anywhere at any price. Untested, \$1; tested, \$2. Wallace R. Beaver, Lincoln, Ill.

FOR SALE—3-band Italian queens ready June 1. Untested, each \$1; twelve, \$10; 100, \$80. No disease here and satisfaction guaranteed. A. E. Crandall & Son, Berlin, Conn.

LEATHER and all dark colored Italian queens, when we have them, mated, \$1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W. Phelps & Son, No. 3 Wilcox St. Binghamton, N. Y.

SWARTS GOLDEN QUEENS produce golden bees of the highest quality; satisfaction guaranteed. Mated, \$1, 6 for \$5; tested, \$2. D. L. Swarts, Lancaster, O., Rt. 2.

WRITE ME for prices on queenless packages in quantity. E. A. Harris, Albany, Ala.

FOR SALE—3-band Italian queens from best honey-gathering strains obtainable. Untested queens, \$1.25 each; 6, \$6.50; 12, \$11. Satisfaction guaranteed. W. T. Perdue, Route No. 1, Fort Deposit, Ala.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, \$1; mated, \$2. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

QUEENS FOR SALE—Quirin's hardy northern bred Italians will please you. All our yards are wintered on summer stands. Tested and breeders ready any time weather permits mailing. Untested about June 1. Orders booked now. Testimonials and price list for asking. Have been a commercial queen-breeder for more than 25 years.

H. G. Quirin, Bellevue, Ohio.

BEEES BY THE POUND OR CAR LOAD—I am now able to supply you with bees and queens in any amount that you might want, having made arrangements with two southern breeders to handle all their early bees. Five other large breeders also have promised to fill my surplus orders. So before buying your bees, get my estimate. I may be able to save you money on express rates, if nothing else. Canadian trade solicited. George W. Brown, Lynnhurst Apiary, Wilson, Wis.

OUR BRIGHT ITALIAN QUEENS will be ready for shipment after April 15. Untested, 75c each; half doz., \$4.50, or \$8 per doz. Select untested, 90c each; half doz., \$5.50, or \$10 per doz. Tested, \$1.50 each. Safe arrival guaranteed. Tillery Bros., R. 5, Box 1D, Georgiana, Ala.

QUEENS from one of Dr. Miller's breeders, tested, \$1.75 each, \$18 per doz; untested, \$1.25 each, \$13 per doz.; 1 frame nucleus, \$3, 2 frames \$5, 3 frames \$6.50 each, without queens. We have never had any disease here. Safe arrival and satisfaction guaranteed. We have no package bees to offer, and no untested queens, except with nuclei. Delivery April 15. Geo. A. Hummer & Sons, Prairie Point, Miss.

GOLDEN ITALIAN QUEENS—Bred for quality, one, \$1; six, \$4.25; twelve, \$8.25; 100, \$60. Tested, \$2 each.
L. J. Pfeifer, Route "A," Los Gatos, Cal.

2500 COLONIES OF BEES—From these apiaries the Edson Co. produce and sell first-class laying Italian queens, leather-colored or goldens. Write for particulars. Address, The Edson Co., Biggs, Cal.

FOR SALE—Bees in 2-pound packages, by parcel post; also the finest Italian queens. Delivery and perfect satisfaction guaranteed. Write for prices. Have 700 colonies to supply from.
Jasper Knight, Hayneville, Ala.

QUEENS—3-banded Italians, from best stock; untested queens in April, May and June, one, \$1; twelve for \$10. Tested, \$1.50 each; if you want as many as 50 queens, write for prices and discounts on early orders; no disease. Safe arrival and satisfaction guaranteed.
O. D. Rivers,
Route 4, Honey Grove, Texas.

WANTED—Bees in lots of 5 to 50 or more colonies.
J. F. Coyle, Penfield, Ill.

FOR SALE—Leather-colored Italian queens, tested, to June 1, \$2; after \$1.50; untested, \$1; \$10 per dozen.
A. W. Yates,
15 Chapman St., Hartford, Conn.

GOLDEN ITALIAN QUEENS and bees; honey-getters, prolific and gentle. Bees by the pound. Write for prices.
J. W. Rice, Box 64, Fort Smith, Ark.

FOR SALE—30 hives of black bees in 8 and 10-frame hives, new and painted; for bulk honey, \$6.50 per hive.
J. T. Collins, Ludowici, Ga.

BEES AND QUEENS from my New Jersey apiary.
J. H. M. Cook,
14th 84 Cortland St., New York City.

FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1.
J. F. Diemer, Liberty, Mo.

FOR SALE

FOR SALE—92 acres of good tillable land, all fenced, 1½ miles from Columbia river, near fireweed belt; 60 miles west of Portland, Ore. Will include apiary of 86 colonies and supplies for between 200 and 300 for comb and extracted honey. Large workshop; fine location; 20 acres clear bottom land, creek for fishing on the place; 25 acres of young fir timber. Large, modern new house; room for two families; good orchard; school house on place. Spring water piped everywhere. Cement walks and fountain. Lawn, two barns 100 feet long; outbuildings, etc. Lots of farm implements, including some furniture, 3 cows and 1 horse. Mild climate, short winters, no wind or storms. A fine location, as there is a big out ranch of 1,000 acres of logged-off land. Logging company under obligation to carry freight. A bargain at price, \$8,000; \$3,000 down, balance time at 6 per cent.
Mrs. L. Schmitt, Oak Point, Wash.

FOR SALE OR EXCHANGE—One Hatch wax press; also one Barnes foot-power saw.
Frank Hoopes, East Downingtown, Penn.

FOR SALE—Root Novice Extractor, never used; perfect condition, \$20.
George Graves, Gt. Barrington, Mass.

FOR SALE—Silver Spangled Hamburg eggs and fine, rare old Paganini violin for sale.
Elias Fox, Union Center, Wis.

FOR SALE—1,000 fence separators, \$2.50 per 100; 2,000 slotted wood separators, \$1 per 100; chain or slotted section holders, \$3 per 100; 2,000 Lewis No. 1 sections plain and beeway 4¼x4¼, at \$4 per 500, new; 500 Jumbo frames, \$1 per 100; 75 24-lb. 2 in glass single tier Lewis shipping cases, \$10 per 25; 2 Daisy foundation fasteners, with lamps, at 75c and \$1.50; 10-oz. round screw cap honey jars with liner in 2-doz. reshipping cases, per gross, \$6. 100 division boards at 5c each.
Edw. A. Winkler, Joliet, Ill.

FOR SALE—20 colonies Italian bees in new Lewis painted, wired 8-frame hives; 24 8-frame, full story extracting supers, with wired full comb frames; 10 queen excluders (wire); 10 bee escapes, 1 Cowan No. 15 extractor; all new; a bargain.
A. S. Kriebel, Pittsville, Wis.

FOR SALE—A nice little bee farm, 40 acres, and apiary; a good location for a bee man; no better location in Wisconsin or Michigan; territory not occupied; fine roads; will give details and reasons for selling to anyone interested.
G. C. Chase, Robbins, Wis.

FOR SALE—We offer for sale the following slightly shopworn supplies, which are as good as new for all practical purposes, and of standard make, at reduced prices, as listed:
50 10-fr. Dov. supers with 5¼ shallow extracting frames, in crates of 5\$4 per crate
70 10-fr. Dov. supers for 5¼ shallow extracting frames, empty, in crates of 5, \$2.25 per crate
50 8-frame Tri-State bodies, with loose hanging frames, in crates of 5\$4 per crate
50 8-frame Tri-State bodies, empty crates of 5\$2.65 per crate
30 10-frame Wisconsin supers, complete with inside fixtures, in crates of 5, \$2.50 per crate
Dadant & Sons, Hamilton, Ill.

FOR SALE—3-banded Italian bees for May delivery:
1 lb. bees with untested queen\$3.00
2 lbs. bees with untested queen5.00
2 fr. nuclei with untested queen5.00
3-fr. nuclei with untested queen6.00
1 full colony in 8-fr. D. T. hive on wired comb10.00
My bees have taken more first premiums at the Iowa State Fair than any other in the past 30 years. Discount on orders with cash for March, 5 per cent; for April, 3 per cent. Reference, any bank in Knoxville, Ia.
J. W. Bittenbender, Knoxville, Iowa.

FOR SALE—About 300 extracting supers, 8 and 10-frame size.
C. E. Keister,
Clarno, Wis.

FOR SALE—Bee hives, supers, sections, smokers, bee veils. Foundation and bee books illustrated. Catalog for stamp.
J. J. Fitzgerald, Mitchell, S. D.

FOR SALE—Bees, 1-lb, \$2; 2-lbs, \$3.75; 3-lbs., \$5.50; 3-banded queens, untested, \$1.25; tested, \$2 each. Deliveries of pound packages from April 20 to May 20; queens until July 1.
Elevation Apiaries, Milano, Texas.

FOR SALE—2 nearly new 22-cal. repeating rifles; will trade for extractor or typewriter. Write. Wm. Feier, Jr., Mason, Mich., R. 2.

FOR SALE—Bees, queens and supplies. Discount early orders.
R. Kramske, 1104 Victor St., St. Louis, Mo.

FOR SALE—5¼ acres of ground, 100 stands of bees; will sell cheap. Ill health reason for selling. Write for particulars.
W. E. Gray, Wyoming, Ill.

FOR SALE—20 8-fr. 1½-story Falcon Dov. hives, section and foundation, metal covers: K. D.\$85.00
5 K. D. 8-fr. super foundation and section 6.00
3,000 No. 1 1¼ Falcon sections\$27.00
1,000 No. 2 1¼ Falcon sections\$ 8.75
8 8-fr. zinc and wire excluders\$ 2.50
19 lbs. thin super foundation\$16.00
30 lbs. med. brood foundation, L size\$22.00

All new standard goods; \$165 takes the lot. Speak quick.
Anton G. Anderson, Holden, Mo.

FOR SALE—A well equipped apiary of 75 colonies of a good strain of bees (Italians) in a good location for honey, and have established a market and good price for my honey.
P. J. Thullen, Huntsville, Ala.

FOR SALE—New hives, ¾-in. white pine, bottom-boards, covers and frames for sale at 33 per cent off usual prices. Write for particulars.
O. L. Rothwell, Gillett, Pa.

FOR SALE—Clover and buckwheat honey in any style container (glass or tin). Let us quote you.
The Deroy Taylor Co.,
Newark, N. Y.

FOR SALE—A limited number of bees and queens for May delivery from either home apiaries of South Carolina; safe delivery guaranteed if shipped by express. Parcels post shipments at buyer's risk. We invite correspondence as to details and price.
The Deroy Taylor Co., Newark, N. Y.

HATCHING EGGS—Plymouth Rocks, all varieties; Anconas and Rouen ducks. Illustrated catalog 3c.
Sheridan Poultry Yards,
R. 13, Sheridan, Mich.

FOR SALE—Frame nailing device. You can make very satisfactory and simple device. Send 50c for drawings showing construction and operation for nailing Hoffman frames; use idea for nailing any style of frame.
Clarence Aldrich, Santa Barbara, Calif.

FOR SALE—40,000 pounds of No. 1 extracted clover honey and 35,000 pounds of aster honey; both of extra light color, heavy body and fine flavor, in 60-lb. cans.
W. B. Wallin, Brooksville, Ky.

FOR SALE—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

FOR SALE—Finest quality clover and buckwheat extracted honey, in 60-pound cans.
O. W. Bedell, Earlville, N. Y.

SITUATIONS

WANTED—Man with some experience to work with bees coming season; state age, experience and wages; we furnish board. The Rocky Mountain Bee Co., Billings, Mont., Box 1319.

WANTED—Work by Australian expert, between April and July 16; managed 500-colony apiary; produced 19 tons in one season; expert queen raiser (after Doolittle). Reply at once, stating wages. 39337 for Rosser J. H., care Miss Lahey, 23 Paddington Green, London, W. Q.

WANTED—Situation; student having attended winter course in general agriculture and also special course in beekeeping, held at Cornell University this winter, is anxious to secure employment in apiary, preferably in New York State. Strong, interested and careful.
H. J., care American Bee Journal,
Hamilton, Ill.

WANTED—A position as assistant in apiary by a strong, young college woman interested in commercial beekeeping. Ready to begin work at any time.
Camelia Winford,
120 Oak Ave., Ithaca, N. Y.

WANTED—For the season of 1919, one or more men to work with bees. State age, experience, wages, and give reference.
A. J. McCarty,
712 Coffman St., Longmont, Colo.

WANTED—One experienced man, and students or helpers in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck; located near Summer resorts. Write, giving age, height, weight, experience, reference and wages wanted.
W. A. Latshaw Co., Clarion, Mich.

WANTED—Two brothers, both single, well experienced in apiary work, orchard and poultry raising, desire to purchase apiary, part cash to be paid down, or are willing to run apiary on shares or for wages. Both elderly men and trustworthy.
H. R., care American Bee Journal,
Hamilton, Ill.

SUPPLIES

BEEKEEPERS OF THE NORTHWEST—Save by ordering your supplies near home. Standard goods; Factory prices.
Geo. F. Webster, Sioux Falls, S. Dak.

FOR SALE—100 8-frame wood and zinc excluders and 100 8-frame unbound zinc excluders, 25c each; these excluders have only been in use one season and are as good as new; have been thoroughly boiled.
Wm. Ritter, Palmdale, Calif.

FOR SALE—Extra good second-hand cypress supers at 60c and bodies at 80c; also three Root honey extractors, cheap. Write for price.
Mitchell & Mathis, Falls City, Texas.

WANTED—Used hives and supers, foundation mills, extractors, bees and bee equipment. State lowest cash price wanted.
W. A. Latshaw Co., Carlisle, Ind.

ALWAYS the best place to get your supplies is at the same old place of H. S. Duby & Son, St. Anne, Ill. No one can beat us on price. Free price list.

MISCELLANEOUS

SHORT COURSE LECTURES—Typewritten reproductions of complete shorthand report of the 18 principal lectures by Dr. E. F. Phillips and G. S. Demuth, of the U. S. Department of Agriculture, at Davis, San Diego and Visalia, Calif., meetings and repeated at Cornell University. See February Bee Journal. Complete with questions and answers, black-board diagrams, etc. Beekeeping principles practically applied to both eastern and California conditions. These are straight talks on bees and beekeeping; 55,000 words—nearly equal to a 200-page book. Price \$1.75.
R. B. Calkins, 5800 Hearn St., Oakland, Calif.

WE WANT every subscriber of the American Bee Journal to become a subscriber of the Domestic Beekeeper. Listen: A \$5 (or more) order of beekeepers' supplies at catalog price bought through the Domestic Beekeeper, Northstar, Mich., and a dollar extra for a year's subscription to the Domestic Beekeeper, will entitle you to a dollar rebate, leaving your subscription to the Domestic Beekeeper absolutely free. Could one ask more? This offer will give one an idea of what the Domestic Beekeeper is doing for its subscribers in the way of buying their supplies.

E. D. TOWNSEND, the present owner of the Domestic Beekeeper, bought beekeepers' supplies for the National Beekeepers' Association for several years. He is now buying for the subscribers of the Domestic Beekeeper at the same low manufacturers' price. Listen now what he has got up his sleeve: Any American Bee Journal subscriber buying \$5 worth of supplies through the Domestic Beekeeper at catalog price, and sending along an extra dollar to pay for a year's subscription to the Domestic Beekeeper, will get in return a rebate check of \$1, leaving the year's subscription to the Domestic Beekeeper absolutely free to you. Of course, if your order for supplies is larger than \$5 you will have a correspondingly larger rebate check on your order. One of our subscribers got a rebate check on his order of supplies last month, March, of \$40. It was just like getting money from home to him, as he sent us the same money he would have had to pay if he had bought through the regular dealer in beekeeper supplies. More and more, close buyers of beekeepers' supplies are investigating the buying facilities of the Domestic Beekeeper. A word to the wise should be sufficient to cause you to send your next order for beekeeper supplies to the Domestic Beekeeper, Northstar, Michigan.

SONG—"The Plea of the Bee," or "The Honey-bee Doing Its Bit." Sent to any address on receipt of 15 cents. The Cutting Publishing Co., 910 Merchants Bank Bldg., Indianapolis, Ind.

THE WAGNER CAPPING MELTER—No experiment, in use over 5 years, highly recommended by practical apiarists all over the country; a perfect machine; separates honey from cappings and broken combs, while at the same time heats honey knives. Cheapest in price, cheapest to operate. Price only \$7.50, fully guaranteed.
A. F. Wagner,
Bonita, San Diego Co., Calif.

HONEY AND BEESWAX

CLOVER-AMBER BLEND HONEY in new 60-pound cans. Satisfaction guaranteed.
Van Wyngarden Bros., Hebron, Ind.

FOR SALE—4 60-lb. cans choice extracted buckwheat honey, 1 60-lb. can clover and buckwheat mixed, 400 sections fine quality buckwheat honey, about 400 sections fine clover and about 200 sections clover and buckwheat mixed in 4¼x1¼ sections. Will sell the whole lot at 19c or a part of it at 20c, f. o. b. here. Send cash with order.
Wilmer Clarke, Earlville, Mad. Co. N. Y.

FOR SALE—Buckwheat honey in 120-lb. cases, at 17c per pound.
C. B. Howard,
Geneva, N. Y.

CLOVER and heartsease honey, fine flavor, in new 60-lb. cans at 23c.
Edw. A. Winkler, Joliet, Ill.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 8c a pound for wax rendered. The Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

FOR SALE—No. 1 white extracted honey in No. 10 pails weighing 10 pounds gross; \$3 per pail f. o. b. here.
B. F. Smith, Jr., Fromberg, Mont.

FOR SALE—Clover, heartsease, No. 1 white comb, \$6 per cas., fancy, \$6.50; extra fancy, \$7; 24 Danz. sections to case; extracted, 120-lb. cases, 25c per pound.
W. A. Latschaw Co., Carlisle, Ind.

FOR SALE—Michigan's best extracted honey in packages to suit. White clover, raspberry, milkweed, buckwheat.
A. G. Woodman, Grand Rapids, Mich.

WANTED—White or light amber extracted honey in any quantity. Kindly send sample, tell how your honey is packed and your lowest cash price; also buy beeswax.
E. B. Rosa, Monroe, Wis.

WANTED—Comb, extracted honey, and beeswax.
R. A. Burnett & Co.,
6A1st 178 S. Water St., Chicago, Ill.

WANTED—Extracted honey, all kinds and grades, for export purposes. Any quantity. Please send samples and quotations.
M. Betancourt, 59 Pearl St., New York City.

WANTED

WANTED—Hand-power extractor of good make and Peterson uncapping outfit; must be in good working order. Give full description and price.
C. H. Larison, Mondamin, Ia.

WANTED—July, 1916, June, July and December, 1917, and January and March, 1918 numbers of the American Bee Journal; will pay 10 cents per copy. Please wrap so that the whole Journal is protected.
American Bee Journal, Hamilton, Ill.

WANT TO BUY BEES—Chester E. Keister,
Clarno, Wis.

WANTED—150 to 200 colonies of bees to work on shares.
M. Knudsen,
320 Second St., Albert Lea, Minn.

WANTED—An extractor and queen excluders.
Harold Hicks, Long Lake, Mich.

WANTED—Section honey. Correspondence solicited.
J. E. Harris, Morristown, Tenn.

WANTED—Bees and Queens. Am still in the market for bees in 1, 2 and 3-pound packages; queens both tested and untested; also 1, 2 and 3-frame nuclei and drawn-out comb on Hoffman frames. Quote me your best prices.
George W. Brown,
Lynnhurst Apiary, Wilson, Wis.

WANTED—A second-hand 2-frame honey extractor and steam uncapping knife. Give full description and lowest price in first letter.
J. J. Fitzgerald, Mitchell, S. D.

WANTED—Good second-hand foot-power circular saw; state condition and price.
John D. Dietrich, Middleville, Mich.

WANTED—A partner with a number of good stands of bees; a No. 1 location. Prefer a middle-aged man and wife. State all your story in first letter. Charter member of the Iowa Bee Association. Separate house to live in.
Harry C. Hartman,
No. 2, Box 12, Braddyville, Page Co., Iowa.

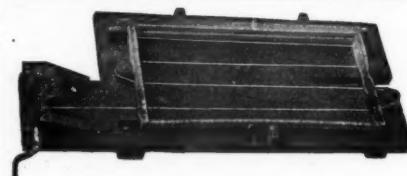
WANTED—to buy between 300 and 500 colonies of bees. Locations must go with it. Give full particulars in first letter. Address,
Box 67, Rigby, Idaho.

WANTED—Your old combs, cappings or slumgum to render into beeswax by our high steam pressure wax presses.
Dadant & Sons, Hamilton, Ill.

CABBAGE CUTTER, SIX KNIVES, slices all vegetables rapidly. Prepaid, \$1; three for \$2.
Lusher Brothers, Elkhart, Ind.

WANTED—December, 1917, and January, 1918 numbers of the American Bee Journal. Will pay 10 cents per copy.
American Bee Journal, Hamilton, Ill.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.



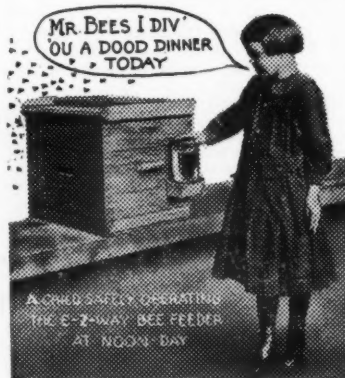
PATENTED

Wright's Frame-Wiring Device

Most rapid in use. Save cost of machine in one day. Tighter wires, no kinks, no sore hands.

G. B. LEWIS CO. Watertown Wis.

U NEED AN E-Z-WAY BEE FEEDER



bees strong by feeding them when they need it. Guard against a honey famine. Full instruction Money Order, Cash or Stamps, to

THE HOLDEN MANUFACTURING CO.,
Clarksburg, W. Va.

TYPEWRITER SENSATION

\$3 or \$4 monthly buys a Beautifully Reconstructed Latest Model Visible Typewriter with back-spacer, decimal tabulator, two-color ribbon, etc. Every late style feature and modern operating convenience. Perfect appearance, perfect action and absolute dependability. Sent anywhere on approval. Catalog and special price FREE. **HARRY A. SMITH (314), 218 North Wells Street, Chicago, Ill.**

Have You Placed Your Order

For summer delivery? Or are you going to let some one get ahead of you? Estimate the number of queens you will need, get in your order now for June and July delivery. Many will be disappointed in getting their queens this season, but if you get your order in now for

FOREHAND'S THREE BANDS

The Thrifty Kind

the bees that have been tested for 27 years, the kind that are unsurpassed by none but superior to many, you will neither be disappointed in the delivery nor in your honey crop. Only one-fourth cash with order. We guarantee pure mating, perfect satisfaction and safe arrival in the United States and Canada.

PRICES

After June 1				After July 1			
	1	6	12		1	6	12
Untested	\$1.25	\$6.50	\$11.50	Untested	\$1.10	\$5.50	\$10.00
Select untested	1.50	7.50	13.25	Select untested	1.25	6.50	11.50
Tested	2.50	13.00	24.50	Tested	2.25	12.00	22.00
Select tested	4.00	22.00	41.00	Select tested	3.50	19.75	37.00

W. J. FOREHAND & SONS, Fort Deposit, Ala.

Golden Italian Queens

RUSTBURG, VA., R. No. 3, March 18, 1918.

Mr. Ben G. Davis:

Dear Sir—Please find enclosed \$5, for which please send me the very best Golden Queen you can for the money. If you can't ship her at once, please notify me. I ordered one from you 3 years ago last fall that was the best I ever saw. Her bees stored 320 pounds of comb honey the first year. I have several of her daughters that are fine.

Hoping to get a good one again, I am yours truly,

J. W. LAWRENCE.

PRICES OF QUEENS

	Nov. 1st to June 1st			June 1st to July 1st			July 1st to Nov. 1st		
	1	6	12	1	6	12	1	6	12
Untested	\$2 00	\$8 50	\$15 00	\$1 50	\$7 50	\$13 50	\$1 25	\$6 50	\$11 50
Select Untested	2 25	9 50	18 00	1 75	9 00	16 00	1 50	7 50	13 50
Tested	3 00	16 50	30 00	2 50	12 00	22 00	2 00	10 50	18 50
Select Tested	3 50	19 50	35 00	3 00	16 50	30 00	2 75	15 00	27 00

Safe arrival, purity of mating and satisfaction guaranteed

No Nuclei or Bees by Pound

Queens for export will be carefully packed in long distance cages, but safe delivery not guaranteed.

BEN G. DAVIS : : Spring Hill, Tenn.

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The first edition of this paper is now out and we are ready for subscriptions or to mail out sample copies. It covers the entire Dixieland with 32 pages of the most instructive matter pertaining to keekeeping.

THE SUBSCRIPTION IS ONE DOLLAR
PER YEAR

DIXIE BEEKEEPER, Waycross, Ga.

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Package bees without queen, as follows:

1 lb., \$2.20; 2 lbs., \$4; 3 lbs., \$5.75
Untested queens, \$1.25 each; tested, \$2.50; select tested, \$3.

E. A. HARRIS, Albany, Ala.

"QUEENS OF QUALITY"

The genuine "Quality" kind of 3-band Italians—bred strictly for business. Write for circular.

J. IVAN BANKS, Dowlletown, Tenn.

TOO LATE TO CLASSIFY

FOR SALE—20 8-frame Dove. hives, excelsior covers and reversible bottoms, \$2.50 each.
13 8-frame No. 1 supers, 75c each.
12 8-frame No. 1 supers with sections and starters in sections, \$1 each. Painted two coats; new, or as good as new.
15 Lang. Simp. supers, complete, 50c each.
1 Doolittle solar extractor, \$4.
1 Lewis foundation fastener, \$1.
6 Alex. feeders, 25c each.
The above have been used, but in good condition; the balance is all new.
200 Hoffman brood-frames, \$5 per hundred.
1 Daisy foundation fastener, 75c.
6 wire entrance guards, 18c each.
1 wire, Alley queen and drone trap, 50c.
2 Carlin foundation cutters, 20c each.
2 Alex. feeders, 25c each.
150 slotted wood separators, \$2.50 for lot.
1 wax tube fastener, 25c.
1 pair bee gloves, 75c.
50 Rauchfuss cages, 3c each.
1 Handy section press, 75c.
1 bristle brush, 20c.
1 spur wire imbedder, 20c.
300 folding cartons for 4¼x1½ sections, \$4 for lot.
56 Hoffman frames with full sheets of wired foundation, 25c each, if packed in hives; 80c if packed separate.
15 lbs. of Dadant's extra thin super foundation, 90c in 5 lb. l's, 85c per pound for lot.
W. S. Pangburn, Center Junction, Ia.

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The W. D. Soper entire stock of Bee Supplies. Send for list. 10 per cent off.

**H. L. SOPER, Admr.,
R. 4, Jackson, Mich.**

TENNESSEE-BRED QUEENS

Forty-Seven Years' Experience In Queen-Rearing
Breed Three-Band Italians Only

	Nov. 1 to June 1			June 1 to July 1			July 1 to Nov. 1		
	1	6	12	1	6	12	1	6	12
Untested	\$2.00	\$ 8.50	\$15.00	\$1.50	\$ 7.50	\$13.50	\$1.25	\$ 6.50	\$11.50
Select Untested ...	2.25	9.50	18.00	1.75	9.00	16.00	1.50	7.50	13.50
Tested	3.00	16.50	30.00	2.50	12.00	22.00	2.00	10.50	18.50
Select Test.d	3.50	19.50	35.00	3.00	16.50	30.00	2.75	15.00	27.00

Capacity of yard, 5,000 queens a year.
 Select queen, tested for breeding, \$5.
 The very best queen, tested for breeding, \$10.

Queens for export will be carefully packed in long distance cages, but safe arrival is not guaranteed. I sell no nuclei, or bees by the pound.

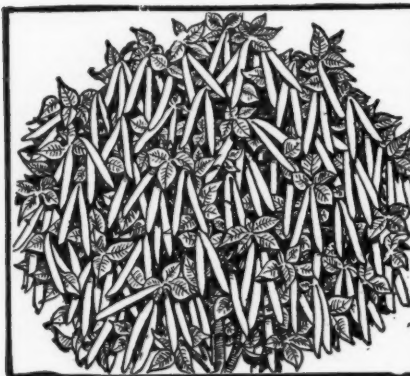
JOHN M. DAVIS, Spring Hill, Tenn.

Binding for Beekeepers

We do all kinds of book binding, such as magazines like the "American Bee Journal," or any other publication. Also make any style blank book, either printed or unprinted heading. Send us your order for blank books and let us bind your magazines.

We also do all kinds of printing, such as Letterheads, Envelopes, Statements or Billheads, Price Lists, Advertising Booklets. No order too large or too small. We print the "American Bee Journal."

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1200 to 1 BEAN

This is a Gigantic Bean—Plants grow strong and erect, branching freely, bearing pods up well from the ground, which literally load the plant. Beans being pure white—of the best quality. Over 200 Pods and 1200 Beans have been grown on a single plant from One Bean planted.

Plant in your garden or any good soil, after danger of frost, anytime up to June 15, only 1 Bean in a hill and they will mature a crop in about 50 days, ripening very evenly, the growth and yield will simply surprise you. Just the Bean everyone should plant this year.

My supply is limited and I can only offer in Sealed Packets, each containing over 60 Beans with growing directions. Order early to be sure of them.

Sealed packets 10c each; 3 pkts. 25c; 7 pkts. 50c; 15 pkts. \$1.00; 36 pkts. (over 2160 Beans) \$2 Postpaid.

My New Seed Book is filled with High Grade Garden Seeds at lowest prices. Do not buy until you see this Book. It will save you money; it's mailed free. F. B. MILLS, Seed Grower, Dept. 40, ROSE HILL, N. Y.

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Price list free.

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NASSAU, CO.

Write for Price List and
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**HIGH-GRADE
 Italian Queens**

JAY SMITH
 Route 3
 Vincennes, Ind.



**Archdekin's Fine Italian Queens and
 Pound Packages**

Untested queens, 75c e.ch. 6 for \$4.25; doz., \$8. Select tested, \$1.25. Safe arrival of queens guaranteed.

Package bees, without queens, \$1.75 per lb. Packages, with queen, 1 lb. and queen, \$2.50; 2-lb. and queen, \$3.75; 3-lb. and queen, \$4.75.

My package is best and lightest in use. Saves bees and express. In case of loss in transit, I will replace loss or recover from express company upon proper presentation of loss by customer. I fully protect my customers from loss.

J. F. ARCHDEKIN,
 Big Bend, La.

Golden Queens

After April 1, untested \$1.25 each, 6 for \$7, or \$13 per doz. or 50 for \$48. Also untested 3-band at same price; tested, \$3 each, and my very best \$5 each. Satisfaction.

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 Route 4, Greenville, Alabama

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 because honey is high. Make it more in demand, so the price will stay where it is. Little stickers on your letters, papers, etc., will help. Printed as below in bright red.



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We handle the finest line of Bee Supplies. Send for our 68-page catalog. Our prices will interest you.

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Established 1885

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New York State Beekeepers' Society will make our Home Apairy (the Honey Bee) their headquarters August 1st, 1919, by holding their Field Meeting here. Do not forget the date as there is being prepared an unusually interesting program, that you will not wish to miss. There will be complete directions how to get here in July number.

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The Home of Better Apiculture

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We also manufacture hives, brood-frames, section holders and shipping cases.

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Bee Keepers' Supply Mfg. Plant.

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Read what J. I. Parent, of Chariton, N. Y., says: "We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work. This winter we have a double amount of hives, etc., to make with this saw. It will do all you say of it." Catalog and price list free.

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that
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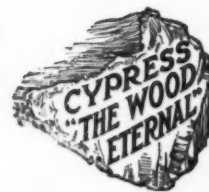
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Service and Quality

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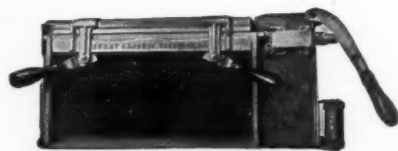
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Order your supplies early, so as to have everything ready for the honey flow, and save money by taking advantage of the early order cash discount. Send for our catalog—better still, send us a list of your supplies and we will be pleased to quote you.

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